



# **Compaq 615 Notebook PC**

# **Compaq 610 Notebook PC**

## Maintenance and Service Guide

Document Part Number: 533504-001

June 2009

This guide is a troubleshooting reference used for maintaining and servicing the computer. It provides comprehensive information on identifying computer features, components, and spare parts; troubleshooting computer problems; and performing computer disassembly procedures.

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First Edition: June 2009

Document Part Number: 533504-001

## Safety warning notice



**WARNING:** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

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## Product description

Category	Description	Compaq 615 Notebook PC	Compaq 610 Notebook PC
Product Name	<b>Compaq 615 Notebook PC</b> <b>Compaq 610 Notebook PC</b>	x	x
Processors	<p><b>AMD® processors:</b></p> <ul style="list-style-type: none"> <li>■ Turion™ RM-74 2.20-GHz processor, 1-MB L2 Cache</li> <li>■ Turion RM-72 2.10-GHz processor, 1-MB L2 Cache</li> <li>■ Athlon™ QL-64 2.10-GHz processor, 1-MB L2 Cache</li> <li>■ Athlon QL-64 2.00-GHz processor, 1-MB L2 Cache</li> <li>■ Sempron™ SI-42 2.10-GHz processor, 512-KB L2 Cache</li> </ul> <p><b>Intel® processors:</b></p> <ul style="list-style-type: none"> <li>■ Intel Core™2 Duo T5870 2.00-GHz processor, 2-MB L2 cache, 800-MHz front side bus (FSB)</li> <li>■ Intel Celeron™ 560 2.13-GHz processor, 1-MB L2 cache, 533-MHz FSB</li> <li>■ Intel Celeron 550 2.00-GHz processor, 1-MB L2 cache, 533-MHz FSB</li> <li>■ Intel Celeron Dual-Core T1500 1.86-GHz processor, 512-KB L2 cache, 533-MHz FSB</li> </ul>	x	x
Chipset	AMD with graphics subsystem with discrete memory: RX781 AMD with graphics subsystem with UMA memory: RS780MN Intel with graphics subsystem with discrete memory: PM965 Intel with graphics subsystem with UMA memory and processor with up to 800-MHz FSB: GME965 Intel with graphics subsystem with UMA memory and processor with up to 533-MHz FSB: GLE960 Southbridge: ICH8m	x x x x x	x

(Continued)

Category	Description	Compaq 615 Notebook PC	Compaq 610 Notebook PC
Graphics	AMD M92S2-LP (ATI Mobile Radeon™ HD 4330) discrete graphics with Hypermemory support, 256 MB DDR2 (64 MB × 16 × 2)	x	x
	AMD Universal Memory Architecture (UMA) graphics (ATI Radeon HD 3200) integrated with shared video memory (dynamically allocated)	x	
	Intel UMA graphics (Mobile Intel GMA X3100) integrated with shared video memory (dynamically allocated)		x
Panel	<ul style="list-style-type: none"> <li>■ 15.6-in, high-definition (1366 × 768), AntiGlare, LED display assembly with webcam</li> <li>■ 15.6-in, HD (1366 × 768), AntiGlare, LED display assembly</li> <li>■ 15.6-in, high-definition (HD, 1366 × 768), BrightView, light-emitting diode (LED) display assembly with webcam</li> <li>■ 15.6-in, high-definition (1366 × 768), BrightView, LED display assembly</li> <li>■ All display assemblies include 2 WLAN antennas</li> <li>■ Supports privacy filter</li> </ul>	x	x
Memory	2 customer-accessible/upgradable memory module slots	x	x
	Supports dual-channel memory		
	Supports the following configurations at 800 MHz and 667 MHz:	x	x
	<ul style="list-style-type: none"> <li>■ 8192-MB total system memory (4096 × 2, dual-channel)</li> <li>■ 4096-MB total system memory (2048 × 2, dual-channel)</li> <li>■ 4096-MB total system memory (4096 × 1)</li> <li>■ 3072-MB total system memory (2048 + 1024, dual-channel)</li> <li>■ 2560-MB total system memory (2048 + 512, dual-channel)</li> <li>■ 2048-MB total system memory (1024 × 2, dual-channel)</li> <li>■ 2048-MB total system memory (2048 × 1)</li> <li>■ 1536-MB total system memory (1024 + 512, dual-channel)</li> <li>■ 1024-MB total system memory (512 × 2, dual-channel)</li> <li>■ 1024-MB total system memory (1024 × 1)</li> <li>■ 512-MB total system memory (512 × 1)</li> </ul>		

*(Continued)*

Category	Description	Compaq 615 Notebook PC	Compaq 610 Notebook PC
<b>Memory (continued)</b>	<p>Supports the following configurations at 667 MHz:</p> <ul style="list-style-type: none"> <li>■ 4096-MB total system memory (2048 × 2, dual-channel, only on GME965 and PM965 system boards)</li> <li>■ 4096-MB total system memory (4096 × 1, only on GME965 and PM965 system boards)</li> <li>■ 3072-MB total system memory (2048 + 1024, dual-channel, only on GME965 and PM965 system boards)</li> <li>■ 2560-MB total system memory (2048 + 512, dual-channel, only on GME965 and PM965 system boards)</li> <li>■ 2048-MB total system memory (1024 × 2, dual-channel)</li> <li>■ 2048-MB total system memory (2048 × 1)</li> <li>■ 1536-MB total system memory (1024 + 512, dual-channel)</li> <li>■ 1024-MB total system memory (512 × 2, dual-channel)</li> <li>■ 1024-MB total system memory (1024 × 1)</li> <li>■ 512-MB total system memory (512 × 1)</li> </ul>	x	x
<b>Hard drives</b>	<p>Supports 9.50-mm, 6.35-cm (2.50-in) hard drives</p> <p>Supports HP DriveGuard Hard Drive Protection</p> <p>Customer-accessible</p> <p>Serial ATA (SATA)</p> <p>Supports the following hard drives:</p> <ul style="list-style-type: none"> <li>■ 500-GB, 5400-rpm</li> <li>■ 320-GB, 5400-rpm</li> <li>■ 250-GB, 7200- and 5400-rpm</li> <li>■ 160-GB, 7200- and 5400-rpm</li> </ul>	x	x
<b>Optical drives</b>	<p>12.7-mm tray load</p> <p>Serial ATA (SATA)</p> <p>Fixed (removal of 1 screw required)</p> <p>Customer-accessible</p> <p>Parallel ATA</p> <p>Supports no-optical-drive option</p> <p>Supports the following drives:</p> <ul style="list-style-type: none"> <li>■ DVD±RW and CD-RW SuperMulti Double-Layer Drive with LightScribe</li> <li>■ 8X DVD-ROM Drive</li> </ul>	x	x
<b>Microphone</b>	Integrated IDT92HD75 microphone	x	x
<b>Audio</b>	<p>Single mono speaker</p> <p>Headphone jack</p> <p>Microphone jack</p>	x	x
<b>Webcam</b>	Integrated 2-megapixel webcam with fixed focus	x	x

(Continued)

Category	Description	Compaq 615 Notebook PC	Compaq 610 Notebook PC
<b>Modem</b>	56k, v.92 data/fax modem	x	x
	Supports no modem option	x	x
	For use in Brazil	x	
<b>Ethernet</b>	Marvell 88E8042 10/100 network interface card (NIC)	x	x
	S3/S4/S5 wake on LAN (AC mode only)	x	x
<b>Power requirements</b>	90-W AC adapter for use only on computer models equipped with a graphics subsystem with discrete memory	x	x
	65-W AC adapter for use only on computer models equipped with a graphics subsystem with UMA memory	x	x
	Battery options: 8-cell, 2.55-Ah (63-Wh) Li-ion battery 6-cell, 2.20-Ah (47-Wh) Li-ion battery	x	x
<b>Wireless</b>	Integrated WLAN options by way of wireless module 2 wireless antennas built into display assembly Supports no-WLAN option Support for the following WLAN formats: <ul style="list-style-type: none"> <li>■ Broadcom 4322AGN 802.11a/b/g/n WLAN module with Bluetooth®</li> <li>■ Broadcom 4322AGN 802.11a/b/g/n WLAN module</li> <li>■ Broadcom 4312G 802.11a/b/g WLAN module with Bluetooth</li> <li>■ Broadcom 4312G 802.11a/b/g WLAN module</li> <li>■ Intel PRO/wireless 3945 802.11a/b/g WLAN module with Bluetooth</li> <li>■ Intel PRO/wireless 3945 802.11a/b/g WLAN module</li> <li>■ Intel PRO/wireless 3945 802.11b/g WLAN module with Bluetooth (for use in Jordan, Kuwait, and the United Arab Emirates only)</li> <li>■ Intel PRO/wireless 3945 802.11b/g WLAN module (for use in Jordan, Kuwait, and the United Arab Emirates only)</li> </ul>	x	x
<b>External media cards</b>	One ExpressCard slot, supporting optional ExpressCard/34 cards SD Card Reader supporting MultiMediaCard (MMC), MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC), Secure Digital (SD) Memory Card, Secure Digital High Capacity (SDHC) Memory Card, and Secure Digital High Speed (SDHS) Memory Card	x	x

(Continued)

Category	Description	Compaq 615 Notebook PC	Compaq 610 Notebook PC
<b>Ports</b>	Audio-in (mono microphone)	x	x
	Audio-out (stereo headphone)	x	
	Multi-pin AC power	x	x
	RJ-45 (Ethernet, includes link and activity lights)	x	x
	RJ-11 (modem)	x	x
	USB v. 2.0 (3)	x	x
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75 GHz	x	x
<b>Keyboard/pointing devices</b>	Keyboard TouchPad with 2 TouchPad buttons Supports 2-way scroll Taps enabled as default	x	x
<b>Security</b>	Security cable slot	x	x
<b>Operating system</b>	<b>Preinstalled with MS Basics:</b> <ul style="list-style-type: none"><li>■ Windows Vista® Home Basic (32 bit, English and Japanese only)</li><li>■ Windows Vista Business (32 bit, English and Japanese only)</li><li>■ Windows Vista Business (32 bit, Japanese only)</li></ul> <b>Preinstalled with MS Office:</b> <ul style="list-style-type: none"><li>■ Windows Vista ® Basic (32 bit) with Office 2007 Ready</li><li>■ Windows Vista Home Basic (32 bit) with Office 2007 Ready without Powerpoint (Japanese only)</li><li>■ Windows Vista Home Basic (32 bit) with Office 2007 Personal with Powerpoint (Japanese only)</li><li>■ Windows Vista Home Basic (32 bit) with Office 2007 Professional (Japanese only)</li><li>■ Windows Vista Business (32 bit) with Office 2007 Ready</li><li>■ Windows Vista Business (32 bit) with Office 2007 Personal without Powerpoint (Japanese only)</li><li>■ Windows Vista Business (32 bit) with Office 2007 Personal with Powerpoint (Japanese only)</li><li>■ Windows Vista Business (32 bit) with Office 2007 Professional (Japanese only)</li><li>■ Windows Vista Business (32 bit, with Windows XP Pro images) with Office 2007 Ready</li></ul>	x	x

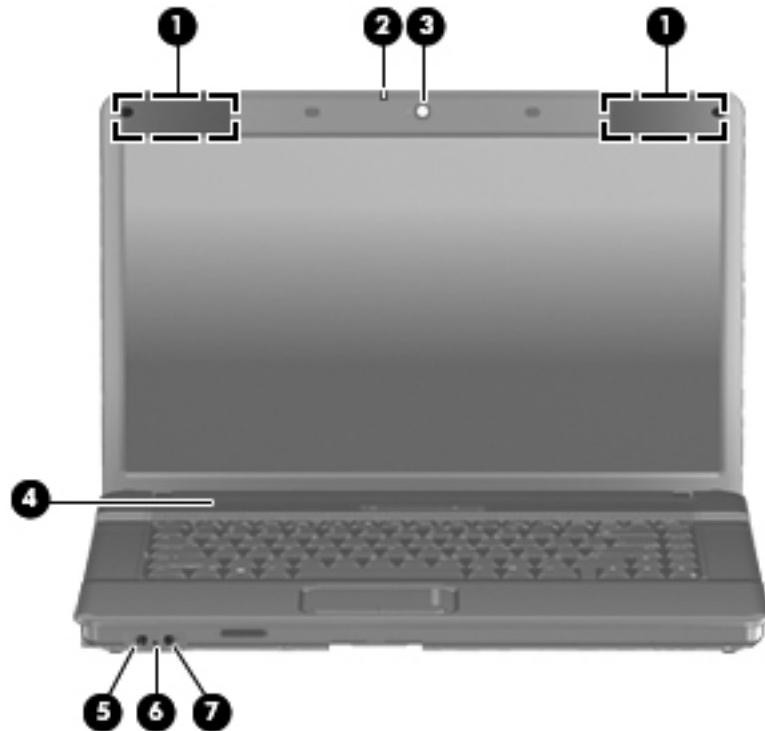
(Continued)

Category	Description	Compaq 615 Notebook PC	Compaq 610 Notebook PC
<b>Operating system (continued)</b>	<b>Preinstalled with MS Office (continued):</b>		
	<ul style="list-style-type: none"> <li>■ Windows Vista Business (32 bit, with Windows XP Pro images) with Office 2007 Personal (Japanese only)</li> <li>■ Windows Vista Business (32 bit, with Windows XP Pro images) with Office 2007 Personal with Powerpoint (Japanese only)</li> <li>■ Windows Vista Business (32 bit, with Windows XP Pro images) with Office 2007 Professional (Japanese only)</li> <li>■ Windows Vista Home Premium (32 bit) with Office 2007 Ready</li> </ul>	x	x
	<b>Preinstalled:</b>	x	x
	<ul style="list-style-type: none"> <li>■ FreeDOS</li> <li>■ SUSE Linux</li> </ul>	x	x
	<b>Restore Media:</b>	x	x
	<ul style="list-style-type: none"> <li>■ Windows Vista Basic (32 bit)</li> <li>■ Windows Vista Business (32 bit)</li> <li>■ Windows Vista Business (64 bit)</li> <li>■ Windows Vista Premium</li> <li>■ Windows XP Pro</li> <li>■ DRDVD Windows Vista</li> <li>■ DRDVD Windows XP Pro</li> <li>■ Red Flag Linux</li> <li>■ SRDVD SuSE Linux</li> <li>■ Office Ready DVD</li> </ul>	x	x
	<b>Certified:</b>	x	x
	<ul style="list-style-type: none"> <li>■ Microsoft® WHQL</li> <li>■ SuSE Linux</li> </ul>	x	
<b>Serviceability</b>	<b>End-user replaceable parts:</b>	x	x
	AC adapter Battery (system) Hard drive Memory modules Optical drive WLAN module		

## External component identification

### Top components

#### Display components



Item	Component	Description
(1)	Wireless antennas (select models only)	<p>On select computer models, at least 2 antennas send and receive signals from one or more wireless devices.</p> <p> The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.</p> <p>To see wireless regulatory notices, refer to the section of the <i>Regulatory, Safety and Environmental Notices</i> that applies to your country or region. These notices are located in Help and Support.</p>
(2)	Webcam light (select models only)	On: The webcam is in use.
(3)	Webcam (select models only)	Records video and captures still photographs.

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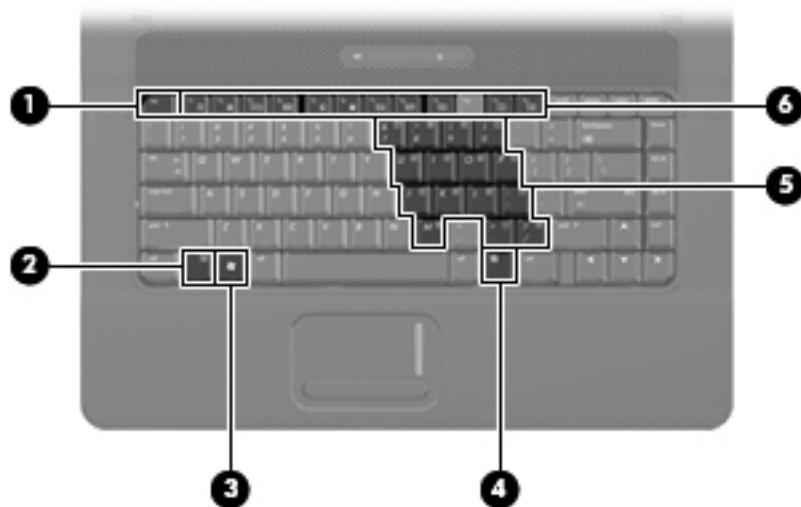
Item	Component	Description
(4)	Speaker	Produces sound.
(5)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.   When a device is connected to the headphone jack, the computer speakers are disabled.
(6)	Internal microphone	Records sound.
(7)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

## Buttons, switch, and speaker



Item	Component	Description
(1)	Internal display switch	Turns off the display if the panel lid is closed while the power is on.
(2)	Wireless button	Turns the wireless feature on or off but does not establish a wireless connection.  ☞ You must set up or access a wireless network to establish a wireless connection.
(3)	Power button	<ul style="list-style-type: none"> <li>■ When the computer is off, press the button to turn on the computer.</li> <li>■ When the computer is on, press the button to shut down the computer.</li> <li>■ When the computer is in the Sleep state, press the button briefly to exit Sleep.</li> <li>■ When the computer is in Hibernation, press the button briefly to exit Hibernation.</li> </ul> <p>If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, select <b>Start &gt; Control Panel &gt; System and Maintenance &gt; Power Options.</b></p>
(4)	Speaker	Produces sound.

## Keys



Item	Component	Description
(1)	esc key	Displays system information when pressed in combination with the <b>fn</b> key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key or the <b>esc</b> key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications key	Displays a shortcut menu for items beneath the pointer.
(5)	Embedded numeric keypad keys	Can be used like the keys on an external numeric keypad.
(6)	Function keys	Execute frequently used system functions when pressed in combination with the <b>fn</b> key.

## Lights



Item	Component	Description
(1)	Caps lock light	On: Caps lock is on.
(2)	Wireless light	<ul style="list-style-type: none"><li>■ Blue: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on.</li><li>■ Amber: All wireless devices are off.</li></ul>
(3)	Power light	<ul style="list-style-type: none"><li>■ On: The computer is on.</li><li>■ Blinking: The computer is in the Sleep state.</li><li>■ Off: The computer is off or in Hibernation.</li></ul>

## Pointing devices



Item	Component	Description
(1)	TouchPad*	Moves the pointer and selects or activates items on the screen.
(2)	Left TouchPad button*	Functions like the left button on an external mouse.
(3)	TouchPad scroll zone	Scrolls up or down.
(4)	Right TouchPad button*	Functions like the right button on an external mouse.

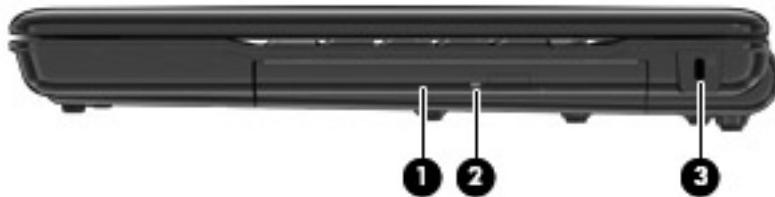
\*This table describes factory settings. To view or change pointing device preferences, select **Start > Control Panel > Hardware and Sound > Mouse**.

## Front components



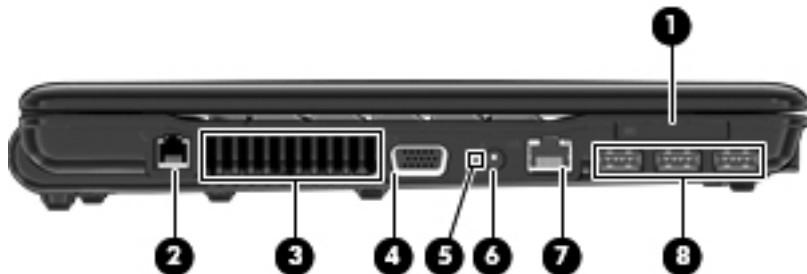
Item	Component	Description
(1)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.  When a device is connected to the headphone jack, the computer speakers are disabled.
(2)	Internal microphone	Records sound.
(3)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(4)	SD Card Reader	Supports the following optional digital card formats: ■ MultiMediaCard (MMC) ■ MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC) ■ Secure Digital (SD) Memory Card ■ Secure Digital High Capacity (SDHC) Memory Card ■ Secure Digital High Speed (SDHS) Memory Card

## Right-side components



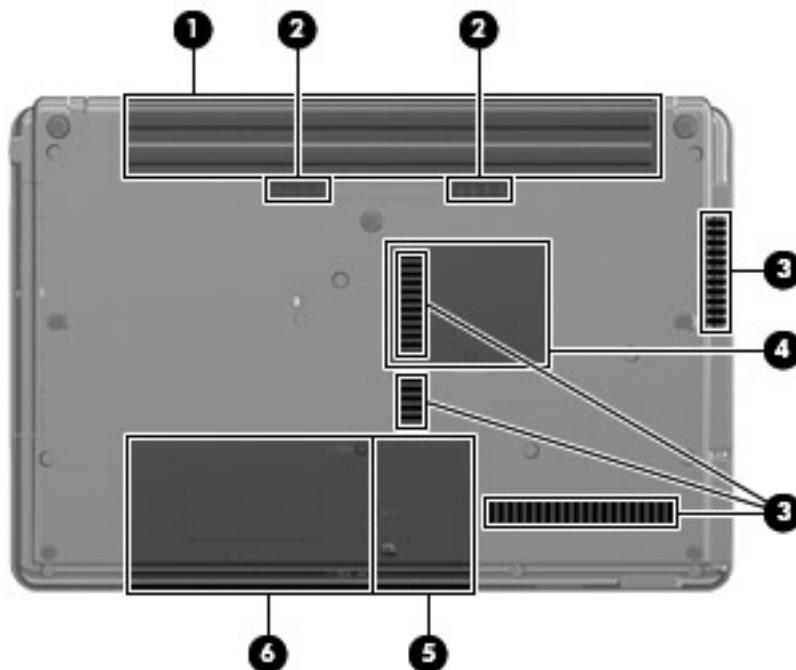
Item	Component	Description
(1)	Optical drive	Reads optical discs and, on select models, also writes to optical discs.
(2)	Optical drive light	Blinking: The optical drive is being accessed.
(3)	Security cable slot	Attaches an optional security cable to the computer.   The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

## Left-side components



Item	Component	Description
(1)	ExpressCard slot	Supports optional ExpressCards.
(2)	RJ-11 (modem) jack (select models only)	Connects a modem cable.
(3)	Vent	Enables airflow to cool internal components.  The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)	External monitor port	Connects an external VGA monitor or projector.
(5)	Battery light	<ul style="list-style-type: none"> <li>■ Amber: A battery is charging.</li> <li>■ Turquoise: A battery is close to full charge capacity.</li> <li>■ Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly.</li> <li>■ Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source the light stays off until the battery reaches a low battery level.</li> </ul>
(6)	Power connector	Connects an AC adapter.
(7)	RJ-45 (network) jack	Connects a network cable.
(8)	USB ports (3)	Connect optional USB devices.

## Bottom components

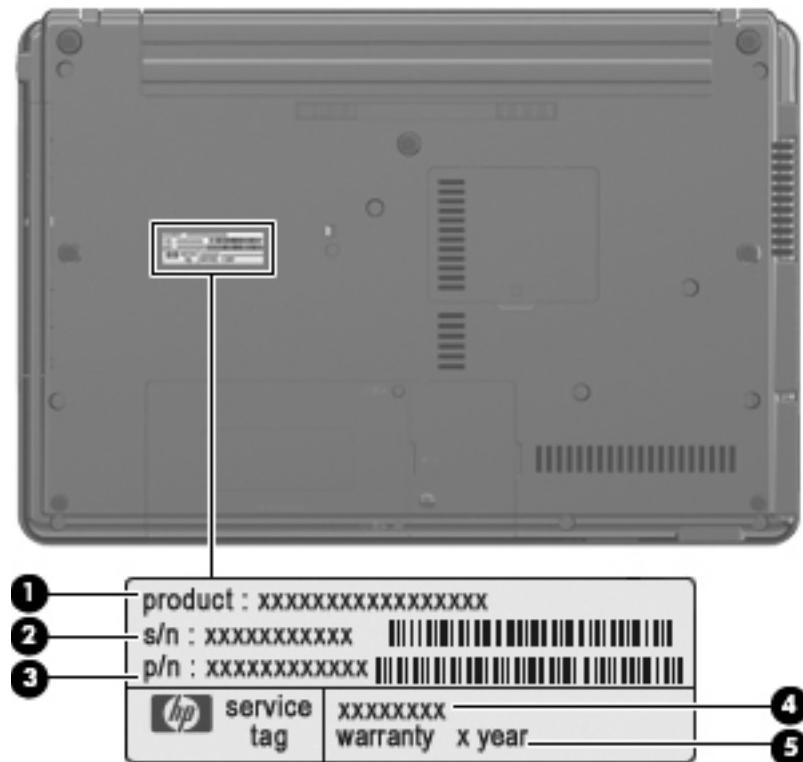


Item	Component	Description
(1)	Battery bay	Holds the battery.
(2)	Battery release latches (2)	Release the battery from the battery bay.
(3)	Vents (4)	Enable airflow to cool internal components.  ☞ The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)	Memory module compartment	Contains the memory module slots.
(5)	WLAN module compartment	Contains the wireless LAN module slot.  ⚠ To prevent an unresponsive system, replace the wireless module with only a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.
(6)	Hard drive bay	Holds the hard drive.

## Illustrated parts catalog

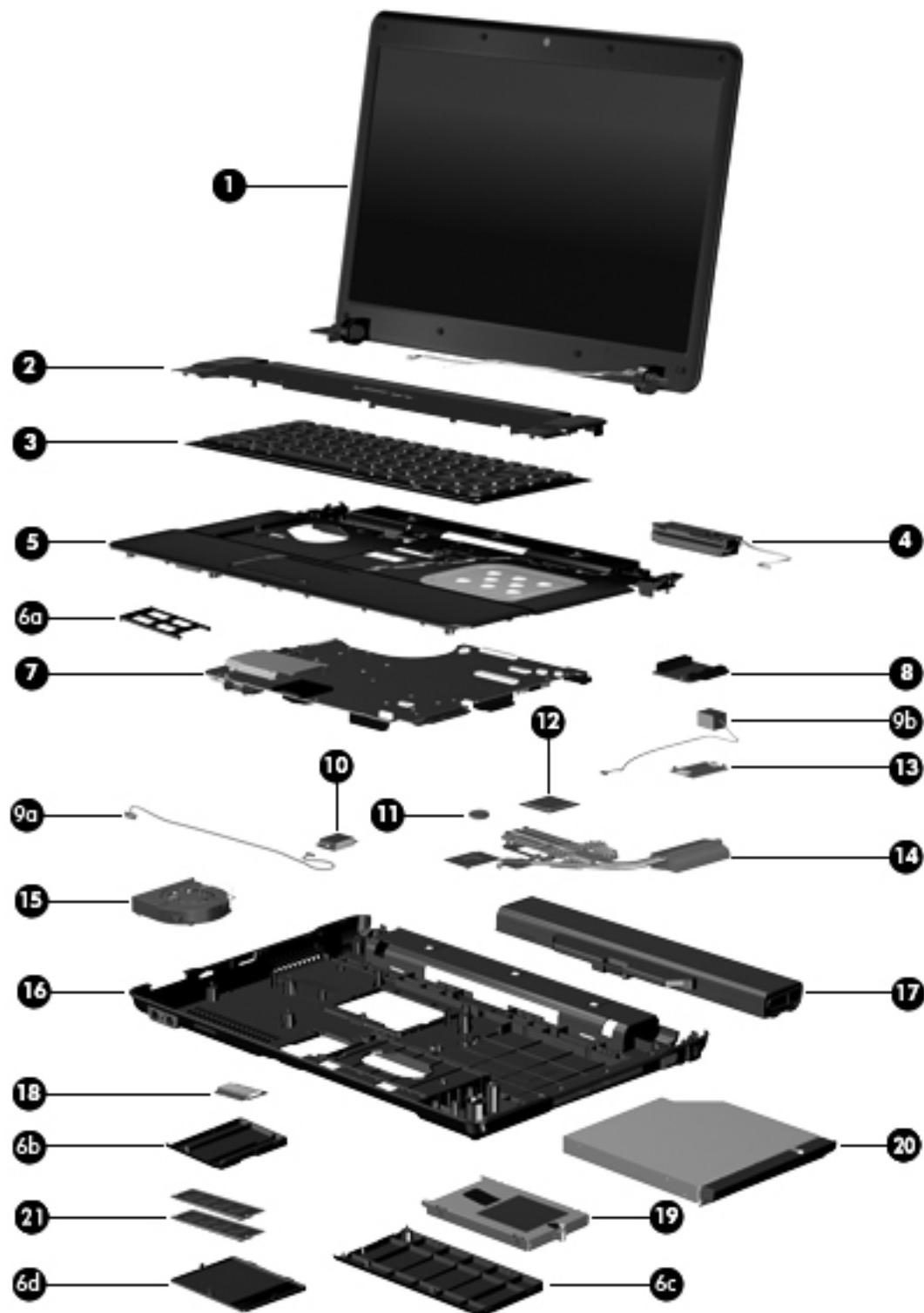
### Service tag

When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag.



Item	Component	Description
①	Product name	This is the product name affixed to the front of the computer.
②	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
③	Part number/Product number (p/n)	This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
④	Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.
⑤	Warranty period	This number describes the duration of the warranty period for the computer.

## Computer major components



Item	Description	Spare Part Number
(1)	<b>15.6-in, SVA, HD display assembly</b> (includes 2 WLAN antenna transceivers and cables, nameplate, and logo):  For use only on computer models equipped with an AMD processor: <ul style="list-style-type: none"><li>■ AntiGlare display assembly for use only on computer models equipped with a webcam 572529-001</li><li>■ AntiGlare display assembly for use only on computer models not equipped with a webcam 572527-001</li><li>■ BrightView display assembly for use only on computer models equipped with a webcam 572530-001</li><li>■ BrightView display assembly for use only on computer models not equipped with a webcam 572528-001</li></ul> For use only on computer models equipped with an Intel processor: <ul style="list-style-type: none"><li>■ AntiGlare display assembly for use only on computer models equipped with a webcam 538423-001</li><li>■ AntiGlare display assembly for use only on computer models not equipped with a webcam 538421-001</li><li>■ BrightView display assembly for use only on computer models equipped with a webcam 538424-001</li><li>■ BrightView display assembly for use only on computer models not equipped with a webcam 538422-001</li></ul>	
	 See "Display assembly subcomponents" on page 3-9 for display assembly internal component spare part information.	
(2)	<b>Switch cover</b> (includes power button board and cable)	538452-001
(3)	<b>Keyboard</b> (includes keyboard cable): <ul style="list-style-type: none"><li>■ For use in Belgium 539682-A41</li><li>■ For use in Brazil 539682-201</li><li>■ For use in Bulgaria 539682-261</li><li>■ For use in the Czech Republic 539682-221</li><li>■ For use in Denmark 539682-081</li><li>■ For use in France 539682-051</li><li>■ For use in French Canada 539682-121</li><li>■ For use in Germany 539682-041</li><li>■ For use in Greece 539682-DJ1</li><li>■ For use in Hungary 539682-211</li><li>■ For use in Iceland 539682-DD1</li><li>■ For use in Israel 539682-BB1</li><li>■ For use in Italy 539682-061</li><li>■ For use in Japan 539682-291</li><li>■ For use in Latin America 539682-161</li><li>■ For use in the Netherlands 539682-B31</li><li>■ For use in Norway 539682-091</li></ul>	

(Continued)

Item	Description	Spare Part Number
(3)	<b>Keyboard</b> (includes keyboard cable):	
	■ For use in Portugal	539682-131
	■ For use in Russia	539682-251
	■ For use in Saudi Arabia	539682-171
	■ For use in Slovakia	539682-231
	■ For use in Slovenia	539682-BA1
	■ For use in South Korea	539682-AD1
	■ For use in Spain	539682-071
	■ For use in Sweden and Finland	539682-B71
	■ For use in Switzerland	539682-BG1
	■ For use in Taiwan	539682-AB1
	■ For use in Thailand	539682-281
	■ For use in Turkey	539682-141
	■ For use in the United Kingdom	539682-031
	■ For use in the United States	539682-001
(4)	<b>Speaker</b>	538453-001
(5)	<b>Top cover</b> (includes TouchPad button board and cable and TouchPad board and cable)	538447-001
	Plastics Kit, includes:	538450-001
(6a)	ExpressCard slot bezel	
(6b)	Wireless module compartment cover	
(6c)	Hard drive cover	
(6d)	Memory module compartment cover	
	 See "Plastics Kit" on page 3-12 for more Plastics Kit spare part information.	
(7)	<b>System board</b> (includes replacement thermal material):	
	For use only on computer models equipped with an AMD processor:	
	■ For use only on computer models equipped with a graphics subsystem with discrete memory	538392-001
	■ For use only on computer models equipped with a graphics subsystem with UMA memory	538391-001
	For use only on computer models equipped with an Intel processor:	
	■ For use only on computer models equipped with a graphics subsystem with discrete memory	538408-001
	■ GL system board use only on computer models equipped with a graphics subsystem with UMA memory	538407-001
	■ GM system board for use only on computer models equipped with a graphics subsystem with UMA memory	538409-001
(8)	<b>Optical drive connector board</b>	538460-001

(Continued)

Item	Description	Spare Part Number
	<b>Cable Kit</b> , includes:	538465-001
(9a)	Bluetooth module cable	
(9b)	Modem module cable (includes RJ-11 connector)	
(10)	<b>Bluetooth module</b>	
	Full-sized Bluetooth module	398393-002
	Reduced form factor Bluetooth module	537921-001
	 The Bluetooth module spare part kits do not include a Bluetooth module cable. The Bluetooth module cables are included in the Cable Kit, spare part number 538465-001.	
(11)	<b>RTC battery</b>	449137-001
(12)	<b>Processor</b> (includes replacement thermal material):	
	AMD Turion RM-74 2.20-GHz processor, 1-MB L2 Cache	507979-001
	AMD Turion RM-72 2.10-GHz processor, 1-MB L2 Cache	507978-001
	AMD Athlon QL-64 2.10-GHz processor, 1-MB L2 Cache	506053-001
	AMD Athlon QL-62 2.00-GHz processor, 1-MB L2 Cache	506052-001
	AMD Sempron SI-42 2.10-GHz processor, 512-KB L2 Cache	508102-001
	Intel Core2 Duo processors:	
	■ T5870 2.00-GHz processor (2-MB L2 cache, 800-MHz FSB)	535835-001
	■ T1500 1.86-GHz processor (1-MB L2 cache, 800-MHz FSB)	576209-001
	Intel Celeron processors:	
	■ 560 2.13-GHz processor (1-MB L2 cache, 533-MHz FSB)	576208-001
	■ 550 2.00-GHz processor (1-MB L2 cache, 533-MHz FSB)	576207-001
(13)	<b>Modem module</b>	
	 The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 538465-001.	
	For use in all countries and regions except Australia and New Zealand	510100-001
	For use only in Australia and New Zealand	510100-011
(14)	<b>Heat sink</b> (includes replacement thermal material):	
	For use only on computer models equipped with an AMD processor:	
	■ For use only on computer models equipped with a graphics subsystem with discrete memory	538459-001
	■ For use only on computer models equipped with a graphics subsystem with UMA memory	538456-001
	For use only on computer models equipped with an Intel processor:	
	■ For use only on computer models equipped with a graphics subsystem with discrete memory	538458-001
	■ For use only on computer models equipped with a graphics subsystem with UMA memory	538457-001
(15)	<b>Fan</b>	538455-001
(16)	<b>Base enclosure</b> (includes seven rubber feet)	538445-001
	<b>Rubber Feet Kit</b> (not illustrated, includes seven feet and eight display bezel screw covers)	538448-001

(Continued)

Item	Description	Spare Part Number
(17) <b>Battery:</b>		
	For use only on computer models equipped with an AMD processor:	
	■ 8-cell, 2.55-Ah (63-Wh) Li-ion battery	572188-001
	■ 6-cell, 2.20-Ah (47-Wh) Li-ion battery	572187-001
	For use only on computer models equipped with an Intel processor:	
	■ 8-cell, 2.55-Ah (63-Wh) Li-ion battery	572191-001
	■ 6-cell, 2.20-Ah (47-Wh) Li-ion battery	572190-001
(18) <b>WLAN module:</b>		
	<b>802.11a/b/g/n WLAN module for use with all computer models:</b>	
	■ Broadcom 4322AGN 802.11a/b/g/n WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	518434-001
	■ Broadcom 4322AGN 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	518434-002

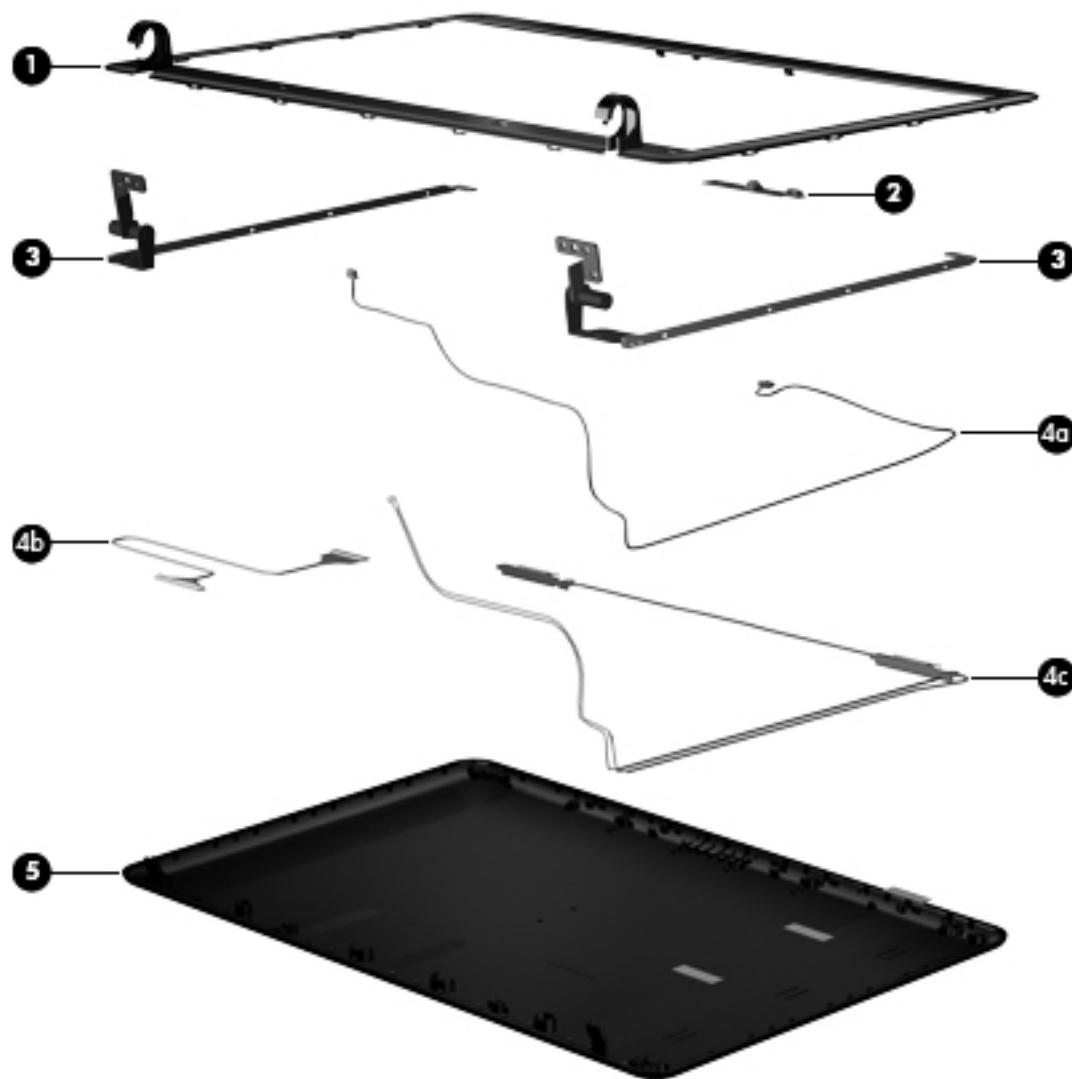
(Continued)

Item	Description	Spare Part Number
(18)	<b>WLAN module:</b>	
<b>802.11a/b/g WLAN modules for use on all computer models:</b>		
	■ Broadcom 4312G 802.11a/b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504593-003
	■ Broadcom 4312G 802.11a/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004
<b>802.11a/b/g WLAN modules for use only on computer models equipped with an Intel processor:</b>		
	■ Intel PRO/wireless 3945 802.11a/b/g WLAN module for use in Antigua and Barbuda, Argentina, Australia, the Bahamas, Barbados, Brunei, Canada, Chile, the Dominican Republic, Guam, Guatemala, Hong Kong, India, Indonesia, Malaysia, Mexico, New Zealand, Panama, Paraguay, Saudi Arabia, Taiwan, the United States, and Vietnam	451861-001
	■ Intel PRO/wireless 3945 802.11a/b/g WLAN module for use in Aruba, Austria, Azerbaijan, Bahrain, Belgium, Bermuda, Brazil, Bulgaria, the Cayman Islands, Colombia, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Jordan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Montenegro, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Romania, Russia, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, the United Kingdom, and Uzbekistan	451861-002
	■ Intel PRO/wireless 3945 802.11a/b/g WLAN module for use in Ecuador, Haiti, Honduras, Pakistan, the People's Republic of China, Peru, Qatar, Uruguay, and Venezuela	451861-003
	■ Intel PRO/wireless 3945 802.11a/b/g WLAN module for use in Japan	407575-291
	■ Intel PRO/wireless 3945 802.11a/b/g WLAN module for use in South Korea	409280-004

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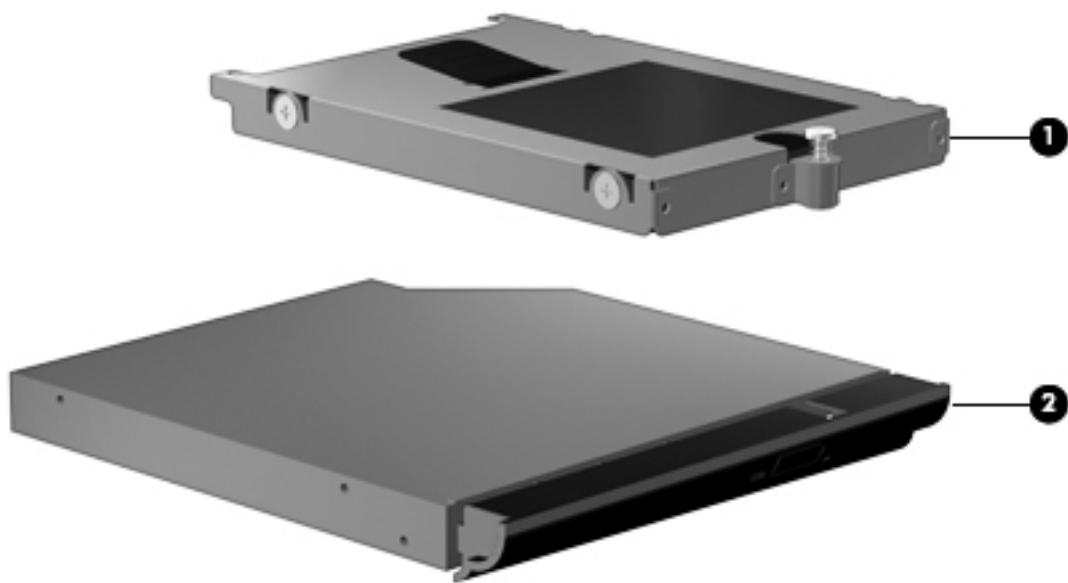
Item	Description	Spare Part Number
(19)	<b>Hard drive</b> (includes hard drive connector and hard drive bracket):  For use only on computer models equipped with an AMD processor: <ul style="list-style-type: none"><li>■ 500-GB, 5400-rpm</li><li>■ 320-GB, 5400-rpm</li><li>■ 250-GB, 7200-rpm</li><li>■ 250-GB, 5400-rpm</li><li>■ 160-GB, 7200-rpm</li><li>■ 160-GB, 5400-rpm</li></ul>	538405-001 538404-001 575199-001 538403-001 575198-001 538402-001
	For use only on computer models equipped with an Intel processor: <ul style="list-style-type: none"><li>■ 500-GB, 5400-rpm</li><li>■ 320-GB, 5400-rpm</li><li>■ 250-GB, 7200-rpm</li><li>■ 250-GB, 5400-rpm</li><li>■ 160-GB, 7200-rpm</li><li>■ 160-GB, 5400-rpm</li></ul>	538440-001 538439-001 575197-001 538438-001 575196-001 538437-001
(20)	<b>Optical drive</b> (includes bezel and bracket):  For use only on computer models equipped with an AMD processor: <ul style="list-style-type: none"><li>■ DVD±RW and CD-RW SuperMulti Double-Layer Drive with LightScribe</li><li>■ DVD-ROM Drive</li></ul>	538406-001 575200-001
	For use only on computer models equipped with an Intel processor: <ul style="list-style-type: none"><li>■ DVD±RW and CD-RW SuperMulti Double-Layer Drive with LightScribe</li><li>■ DVD-ROM Drive</li></ul>	538442-001 538441-001
(21)	<b>Memory modules:</b>  For use only on computer models equipped with an AMD processor: <ul style="list-style-type: none"><li>■ 2048-MB (800-MHz, DDR2)</li><li>■ 1024-MB (800-MHz, DDR2)</li><li>■ 512-MB (800-MHz, DDR2)</li><li>■ 1024-MB (667-MHz, DDR2)</li><li>■ 512-MB (667-MHz, DDR2)</li></ul>	538401-001 538400-001 538399-001 538397-001 538396-001
	For use only on computer models equipped with an Intel processor: <ul style="list-style-type: none"><li>■ 2048-MB (800-MHz, DDR2)</li><li>■ 1024-MB (800-MHz, DDR2)</li><li>■ 512-MB (800-MHz, DDR2)</li><li>■ 2048-MB (667-MHz, DDR2)</li><li>■ 1024-MB (667-MHz, DDR2)</li><li>■ 512-MB (667-MHz, DDR2)</li></ul>	538436-001 538435-001 538434-001 538433-001 538432-001 538431-001

## Display assembly subcomponents



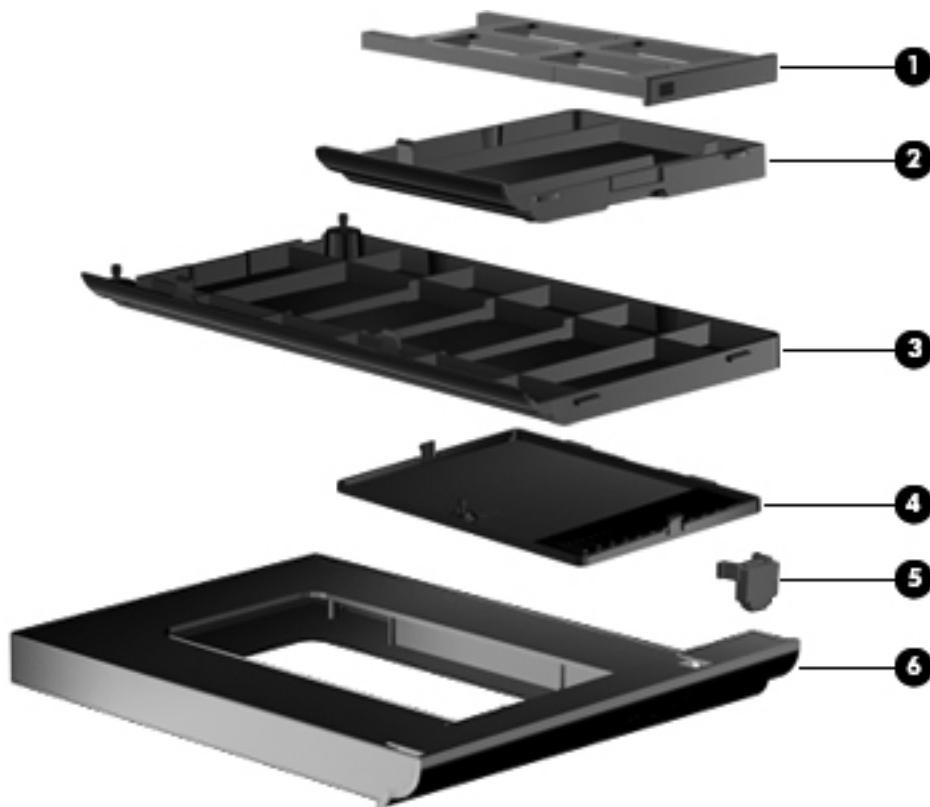
Item	Description	Spare part number
<b>(1)</b>	Display bezel For use only on computer models equipped with a webcam For use only on computer models not equipped with a webcam	538428-001 538427-001
<b>(2)</b>	Webcam module	538443-001
<b>(3)</b>	Display hinges	538462-001
	Display Cable Kit, includes:	538463-001
<b>(4a)</b>	Webcam module cable	
<b>(4b)</b>	Display panel cable	
<b>(4c)</b>	Wireless antenna cable	
<b>(5)</b>	Display enclosure	538430-001

## Mass storage devices



Item	Description	Spare part number
(1)	<b>Hard drive</b> (includes hard drive connector and hard drive bracket):  For use only on computer models equipped with an AMD processor:  ■ 500-GB, 5400-rpm ■ 320-GB, 5400-rpm ■ 250-GB, 7200-rpm ■ 250-GB, 5400-rpm ■ 160-GB, 7200-rpm ■ 160-GB, 5400-rpm	538405-001 538404-001 575199-001 538403-001 575198-001 538402-001
	For use only on computer models equipped with an Intel processor:  ■ 500-GB, 5400-rpm ■ 320-GB, 5400-rpm ■ 250-GB, 7200-rpm ■ 250-GB, 5400-rpm ■ 160-GB, 7200-rpm ■ 160-GB, 5400-rpm	538440-001 538439-001 575197-001 538438-001 575196-001 538437-001
(2)	<b>Optical drive</b> (includes bezel and bracket):  For use only on computer models equipped with an AMD processor:  ■ DVD±RW and CD-RW SuperMulti Double-Layer Drive with LightScribe ■ DVD-ROM Drive	538406-001 575200-001
	For use only on computer models equipped with an Intel processor:  ■ DVD±RW and CD-RW SuperMulti Double-Layer Drive with LightScribe ■ DVD-ROM Drive	538442-001 538441-001

## Plastics Kit



Item	Description	Spare part number
	Plastics Kit:	538450-001
(1)	ExpressCard slot bezel	
(2)	Wireless module compartment cover	
(3)	Hard drive cover (includes three captive screws, secured by C-clips)	
(4)	Memory module compartment cover (includes one captive screw, secured by a C-clip)	
(5)	RJ-11 connector cover	
(6)	Optical drive bay bezel	

## Miscellaneous parts

Description	Spare part number
<b>AC adapters:</b>	
■ 90-W PFC HP Smart Adapter (for use only on computer models equipped with graphics subsystems with discrete memory)	432309-001
■ 65-W PFC HP Smart Adapter (for use only on computer models equipped with graphics subsystems with UMA memory)	417220-001
<b>Power cords:</b>	
■ For use in Argentina	490371-D01
■ For use in Australia	490371-111
■ For use in Brazil	490371-201
■ For use in Europe, the Middle East, and Africa	490371-021
■ For use in Israel	490371-BB1
■ For use in India	490371-D61
■ For use in Italy	490371-061
■ For use in Japan	490371-291
■ For use in the People's Republic of China	490371-AA1
■ For use in South Africa	490371-AR1
■ For use in South Korea	490371-AD1
■ For use in Switzerland	490371-111
■ For use in Taiwan	490371-AB1
■ For use in the United Kingdom and Singapore	490371-031
■ For use in the United States	490371-001
<b>Screw Kit</b>	
■ Phillips PM3.0 × 4.0 screws	538449-001
■ Phillips PM2.5 × 11.0 captive screws	
■ Phillips PM2.5 × 9.0 captive screws	
■ Phillips PM2.5 × 8.0 screws	
■ Phillips PM2.5 × 6.0 screws	
■ Phillips PM2.5 × 5.0 screws	
■ Phillips PM2.5 × 4.0 screws	
■ Phillips PM2.0 × 6.0 captive screws	
■ Phillips PM2.0 × 5.0 captive screws	
■ Phillips PM2.0 × 3.0 broadhead screws	
■ Phillips PM2.0 × 3.0 screws	
■ Phillips PM2.0 × 2.0 broadhead screws	
■ Torx T8M2.5 × 8.0 screws	

## Sequential part number listing

Spare part number	Description
398393-002	Full-sized Bluetooth module  ☞ The Bluetooth module spare part kits do not include a Bluetooth module cable. The Bluetooth module cables are included in the Cable Kit, spare part number 538465-001.
407575-291	Intel PRO/wireless 3945 802.11a/b/g WLAN module for use only on computer models equipped with an Intel processor in Japan
409280-004	Intel PRO/wireless 3945 802.11a/b/g WLAN module for use only on computer models equipped with an Intel processor in South Korea
417220-001	65-W PFC HP Smart Adapter (for use only on computer models equipped with graphics subsystems with UMA memory)
432309-001	90-W PFC HP Smart Adapter (for use only on computer models equipped with graphics subsystems with discrete memory)
449137-001	RTC battery
451861-001	Intel PRO/wireless 3945 802.11a/b/g WLAN module for use only on computer models equipped with an Intel processor in Antigua and Barbuda, Argentina, Australia, the Bahamas, Barbados, Brunei, Canada, Chile, the Dominican Republic, Guam, Guatemala, Hong Kong, India, Indonesia, Malaysia, Mexico, New Zealand, Panama, Paraguay, Saudi Arabia, Taiwan, the United States, and Vietnam
451861-002	Intel PRO/wireless 3945 802.11a/b/g WLAN module for use only on computer models equipped with an Intel processor in Aruba, Austria, Azerbaijan, Bahrain, Belgium, Bermuda, Brazil, Bulgaria, the Cayman Islands, Colombia, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Jordan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Montenegro, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Romania, Russia, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, the United Kingdom, and Uzbekistan
451861-003	Intel PRO/wireless 3945 802.11a/b/g WLAN module for use only on computer models equipped with an Intel processor in Ecuador, Haiti, Honduras, Pakistan, the People's Republic of China, Peru, Qatar, Uruguay, and Venezuela
490371-001	Power cord for use in the United States
490371-011	Power cord for use in Australia
490371-021	Power cord for use in Europe, the Middle East, and Africa
490371-031	Power cord for use in the United Kingdom and Singapore
490371-061	Power cord for use in Italy
490371-111	Power cord for use in Switzerland
490371-201	Power cord for use in Brazil
490371-291	Power cord for use in Japan
490371-AA1	Power cord for use in the People's Republic of China
490371-AB1	Power cord for use in Taiwan
490371-AD1	Power cord for use in South Korea
490371-AR1	Power cord for use in South Africa
490371-BB1	Power cord for use in Israel
490371-D01	Power cord for use in Argentina
490371-D61	Power cord for use in India

(Continued)

Spare part number	Description
504593-003	Broadcom 4312G 802.11a/b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands
504593-004	Broadcom 4312G 802.11a/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
506052-001	AMD Athlon QL-62 2.00-GHz processor (1-MB L2 cache, includes replacement thermal material)
506053-001	AMD Athlon QL-64 2.10-GHz processor (1-MB L2 cache, includes replacement thermal material)
507978-001	AMD Turion RM-72 2.10-GHz processor (1-MB L2 cache, includes replacement thermal material)
507979-001	AMD Turion RM-74 2.20-GHz processor (1-MB L2 cache, includes replacement thermal material)
508102-001	AMD Sempron SI-42 2.10-GHz processor (512-KB L2 cache, includes replacement thermal material)
510100-001	Modem module for use in all countries and regions except Australia and New Zealand  ☞ The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 538465-001.
510100-011	Modem module for use only in Australia and New Zealand  ☞ The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 538465-001.
518434-001	Broadcom 4322AGN 802.11a/b/g/n WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands

(Continued)

Spare part number	Description
518434-002	Broadcom 4322AGN 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
535835-001	Intel Core2 Duo T5870 2.00-GHz processor (2-MB L2 cache, 800-MHz FSB, includes replacement thermal material)
537921-001	Reduced form factor Bluetooth module  ☞ The Bluetooth module spare part kits do not include a Bluetooth module cable. The Bluetooth module cables are included in the Cable Kit, spare part number 538465-001.
538391-001	System board for use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory (includes replacement thermal material)
538392-001	System board for use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory (includes replacement thermal material)
538396-001	512-MB memory module (667-MHz, DDR2) for use only on computer models equipped with an AMD processor
538397-001	1024-MB memory module (667-MHz, DDR2) for use only on computer models equipped with an AMD processor
538399-001	512-MB memory module (800-MHz, DDR2) for use only on computer models equipped with an AMD processor
538400-001	1024-MB memory module (800-MHz, DDR2) for use only on computer models equipped with an AMD processor
538401-001	2048-MB memory module (800-MHz, DDR2) for use only on computer models equipped with an AMD processor
538402-001	160-GB, 5400-rpm hard drive for use only on computer models equipped with an AMD processor (includes hard drive connector and hard drive bracket)
538403-001	250-GB, 5400-rpm hard drive for use only on computer models equipped with an AMD processor (includes hard drive connector and hard drive bracket)
538404-001	320-GB, 5400-rpm hard drive for use only on computer models equipped with an AMD processor (includes hard drive connector and hard drive bracket)
538405-001	500-GB, 5400-rpm hard drive for use only on computer models equipped with an AMD processor (includes hard drive connector and hard drive bracket)

(Continued)

Spare part number	Description
538406-001	DVD±RW and CD-RW SuperMulti Double-Layer Drive with LightScribe for use only on computer models equipped with an AMD processor (includes bezel and bracket)
538407-001	GL system board use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory (includes replacement thermal material)
538408-001	System board for use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory (includes replacement thermal material)
538409-001	GM system board for use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory (includes replacement thermal material)
538421-001	15.6-in, SVA, HD AntiGlare display assembly for use only on computer models equipped with an Intel processor but not equipped with a webcam (includes 2 WLAN antenna transceivers and cables, nameplate, and logo)
538422-001	15.6-in, SVA, HD BrightView display assembly for use only on computer models equipped with an Intel processor but not equipped with a webcam (includes 2 WLAN antenna transceivers and cables, nameplate, and logo)
538423-001	15.6-in, SVA, HD AntiGlare display assembly for use only on computer models equipped with an Intel processor and with a webcam (includes 2 WLAN antenna transceivers and cables, nameplate, and logo)
538424-001	15.6-in, SVA, HD BrightView display assembly for use only on computer models equipped with an Intel processor and with a webcam (includes 2 WLAN antenna transceivers and cables, nameplate, and logo)
538427-001	Display bezel for use only on computer models not equipped with a webcam
538428-001	Display bezel for use only on computer models equipped with a webcam
538430-001	Display enclosure
538431-001	512-MB memory module for use only on computer models equipped with an Intel processor (667-MHz, DDR2)
538432-001	1024-MB memory module for use only on computer models equipped with an Intel processor (667-MHz, DDR2)
538433-001	2048-MB memory module for use only on computer models equipped with an Intel processor (667-MHz, DDR2)
538434-001	512-MB memory module for use only on computer models equipped with an Intel processor (800-MHz, DDR2)
538435-001	1024-MB memory module for use only on computer models equipped with an Intel processor (800-MHz, DDR2)
538436-001	2048-MB memory module for use only on computer models equipped with an Intel processor (800-MHz, DDR2)
538437-001	160-GB, 5400-rpm hard drive for use only on computer models equipped with an Intel processor (includes hard drive connector and hard drive bracket)
538438-001	250-GB, 5400-rpm hard drive for use only on computer models equipped with an Intel processor (includes hard drive connector and hard drive bracket)
538439-001	320-GB, 5400-rpm hard drive for use only on computer models equipped with an Intel processor (includes hard drive connector and hard drive bracket)
538440-001	500-GB, 5400-rpm hard drive for use only on computer models equipped with an Intel processor (includes hard drive connector and hard drive bracket)
538441-001	DVD-ROM Drive for use only on computer models equipped with an Intel processor
538442-001	DVD±RW and CD-RW SuperMulti Double-Layer Drive with LightScribe for use only on computer models equipped with an Intel processor
538443-001	Webcam module

(Continued)

Spare part number	Description
538445-001	Base enclosure (includes seven rubber feet)
538447-001	Top cover (includes TouchPad on/off board and cable, TouchPad button board and cable, and TouchPad board and cable)
538448-001	Rubber Feet Kit (includes seven feet and eight display bezel screw covers)
538449-001	Screw Kit
538450-001	Plastics Kit  See "Plastics Kit" on page 3-12 for Plastics Kit spare part information.
538452-001	Switch cover (includes power button board and cable)
538453-001	Speaker
538455-001	Fan
538456-001	Heat sink for use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory (includes replacement thermal material)
538457-001	Heat sink for use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory (includes replacement thermal material)
538458-001	Heat sink for use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory (includes replacement thermal material)
538459-001	Heat sink for use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory (includes replacement thermal material)
538460-001	Optical drive connector board
538462-001	Display hinges
538463-001	Display Cable Kit  See "Display assembly subcomponents" on page 3-9 for display assembly internal component spare part information.
538465-001	Cable Kit
539682-001	Keyboard for use in the United States (includes keyboard cable)
539682-031	Keyboard for use in the United Kingdom (includes keyboard cable)
539682-041	Keyboard for use in Germany (includes keyboard cable)
539682-051	Keyboard for use in France (includes keyboard cable)
539682-061	Keyboard for use in Italy (includes keyboard cable)
539682-071	Keyboard for use in Spain (includes keyboard cable)
539682-081	Keyboard for use in Denmark (includes keyboard cable)
539682-091	Keyboard for use in Norway (includes keyboard cable)
539682-121	Keyboard for use in French Canada (includes keyboard cable)
539682-131	Keyboard for use in Portugal (includes keyboard cable)
539682-141	Keyboard for use in Turkey (includes keyboard cable)
539682-161	Keyboard for use in Latin America (includes keyboard cable)
539682-171	Keyboard for use in Saudi Arabia (includes keyboard cable)
539682-201	Keyboard for use in Brazil (includes keyboard cable)
539682-211	Keyboard for use in the Hungary (includes keyboard cable)
539682-221	Keyboard for use in the Czech Republic (includes keyboard cable)

(Continued)

Spare part number	Description
539682-231	Keyboard for use in Slovakia (includes keyboard cable)
539682-251	Keyboard for use in Russia (includes keyboard cable)
539682-261	Keyboard for use in Bulgaria (includes keyboard cable)
539682-281	Keyboard for use in Thailand (includes keyboard cable)
539682-291	Keyboard for use in Japan (includes keyboard cable)
539682-A41	Keyboard for use in Belgium (includes keyboard cable)
539682-AB1	Keyboard for use in Taiwan (includes keyboard cable)
539682-AD1	Keyboard for use in South Korea (includes keyboard cable)
539682-B31	Keyboard for use in the Netherlands (includes keyboard cable)
539682-B71	Keyboard for use in Sweden and Finland (includes keyboard cable)
539682-BA1	Keyboard for use in Slovenia (includes keyboard cable)
539682-BB1	Keyboard for use in Israel (includes keyboard cable)
539682-BG1	Keyboard for use in Switzerland (includes keyboard cable)
539682-DD1	Keyboard for use in Iceland (includes keyboard cable)
539682-DJ1	Keyboard for use in Greece (includes keyboard cable)
572187-001	6-cell, 2.20-Ah (47-Wh) Li-ion battery for use only on computer models equipped with an AMD processor
572188-001	8-cell, 2.55-Ah (63-Wh) Li-ion battery for use only on computer models equipped with an AMD processor
572190-001	6-cell, 2.20-Ah (47-Wh) Li-ion battery for use only on computer models equipped with an Intel processor
572191-001	8-cell, 2.55-Ah (63-Wh) Li-ion battery for use only on computer models equipped with an Intel processor
572527-001	15.6-in, SVA, HD AntiGlare display assembly for use only on computer models equipped with an AMD processor but not equipped with a webcam (includes 2 WLAN antenna transceivers and cables, nameplate, and logo)
572528-001	15.6-in, SVA, HD BrightView display assembly for use only on computer models equipped with an AMD processor but not equipped with a webcam (includes 2 WLAN antenna transceivers and cables, nameplate, and logo)
572529-001	15.6-in, SVA, HD AntiGlare display assembly for use only on computer models equipped with an AMD processor and a webcam (includes 2 WLAN antenna transceivers and cables, nameplate, and logo)
572530-001	15.6-in, SVA, HD BrightView display assembly for use only on computer models equipped with an AMD processor and with a webcam (includes 2 WLAN antenna transceivers and cables, nameplate, and logo)
575196-001	160-GB, 7200-rpm hard drive for use only on computer models equipped with an Intel processor (includes hard drive connector and hard drive bracket)
575197-001	250-GB, 7200-rpm hard drive for use only on computer models equipped with an Intel processor (includes hard drive connector and hard drive bracket)
575198-001	160-GB, 7200-rpm hard drive for use only on computer models equipped with an AMD processor (includes hard drive connector and hard drive bracket)
575199-001	250-GB, 7200-rpm hard drive for use only on computer models equipped with an AMD processor (includes hard drive connector and hard drive bracket)

(Continued)

Spare part number	Description
575200-001	DVD-ROM Drive for use only on computer models equipped with an AMD processor (includes bezel and bracket)
576207-001	Intel Celeron 550 2.00-GHz processor (1-MB L2 cache, 533-MHz FSB, includes replacement thermal material)
576208-001	Intel Celeron 560 2.13-GHz processor (1-MB L2 cache, 533-MHz FSB, includes replacement thermal material)
576209-001	Intel Core2 Duo T1500 1.86-GHz processor (1-MB L2 cache, 800-MHz FSB, includes replacement thermal material)

## Removal and replacement procedures

### Preliminary replacement requirements

#### Tools required

You will need the following tools to complete the removal and replacement procedures:

- Flat-bladed screwdriver
- Phillips P0 screwdriver
- Phillips P1 screwdriver
- Torx T8 screwdriver

### Service considerations

The following sections include some of the considerations that you must keep in mind during disassembly and assembly procedures.



As you remove each subassembly from the computer, place the subassembly (and all accompanying screws) away from the work area to prevent damage.

### Plastic parts



**CAUTION:** Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

### Cables and connectors



**CAUTION:** When servicing the computer, be sure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

Cables must be handled with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Be sure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; these cables tear easily.

## Drive handling



**CAUTION:** Drives are fragile components that must be handled with care. To prevent damage to the computer, damage to a drive, or loss of information, observe these precautions:

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
  - Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
  - Before removing a diskette drive or optical drive, be sure that a diskette or disc is not in the drive and be sure that the optical drive tray is closed.
  - Handle drives on surfaces covered with at least one inch of shock-proof foam.
  - Avoid dropping drives from any height onto any surface.
  - After removing a hard drive, an optical drive, or a diskette drive, place it in a static-proof bag.
  - Avoid exposing a hard drive to products that have magnetic fields, such as monitors or speakers.
  - Avoid exposing a drive to temperature extremes or liquids.
  - If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package "FRAGILE."
- 

## Grounding guidelines

### Electrostatic discharge damage

Electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases, ESD contains enough power to alter device parameters or melt silicon junctions.

A discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Even if the spark is neither felt nor heard, damage may have occurred.

An electronic device exposed to ESD may not be affected at all and can work perfectly throughout a normal cycle. Or the device may function normally for a while, and then degrade in the internal layers, reducing its life expectancy.



**CAUTION:** To prevent damage to the computer when you are removing or installing internal components, observe these precautions:

- Keep components in their electrostatic-safe containers until you are ready to install them.
  - Use nonmagnetic tools.
  - Before touching an electronic component, discharge static electricity by using the guidelines described in this section.
  - Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.
  - If you remove a component, place it in an electrostatic-safe container.
-

The following table shows how humidity affects the electrostatic voltage levels generated by different activities.



**CAUTION:** A product can be degraded by as little as 700 V.

#### Typical electrostatic voltage levels

Event	Relative humidity		
	10%	40%	55%
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tube	2,000 V	700 V	400 V
Removing DIPS from vinyl tray	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	14,500 V	5,000 V	3,500 V
Removing bubble pack from PCB	26,500 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V

#### Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

## Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

## Equipment guidelines

Grounding equipment must include either a wrist strap or a foot strap at a grounded workstation.

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm  $\pm 10\%$  resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

The following table lists the shielding protection provided by antistatic bags and floor mats.

Material	Use	Voltage protection level
Antistatic plastic	Bags	1,500 V
Carbon-loaded plastic	Floor mats	7,500 V
Metallized laminate	Floor mats	5,000 V

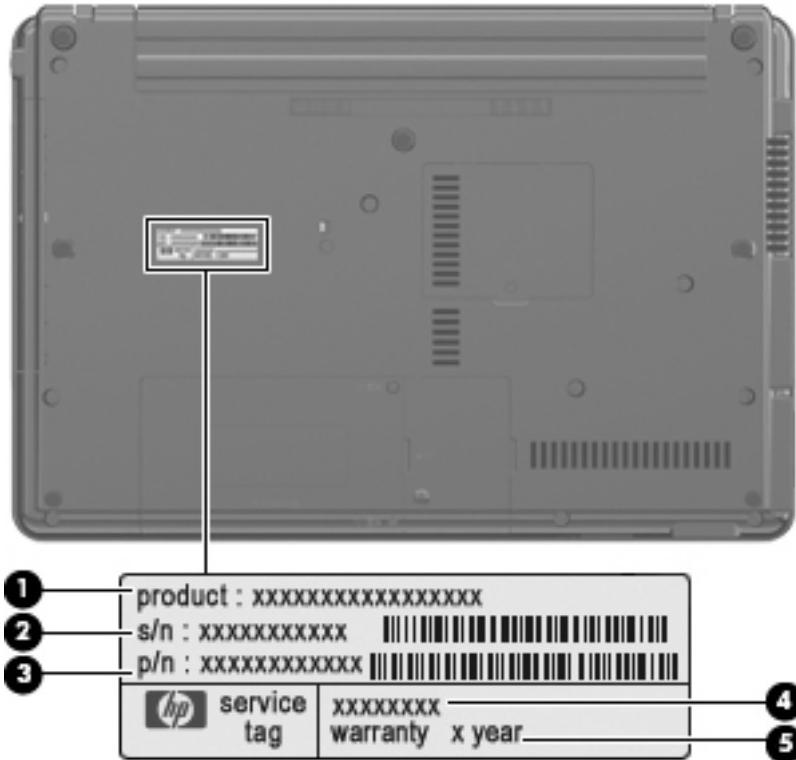
## Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 76 screws, in 15 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

### Service tag

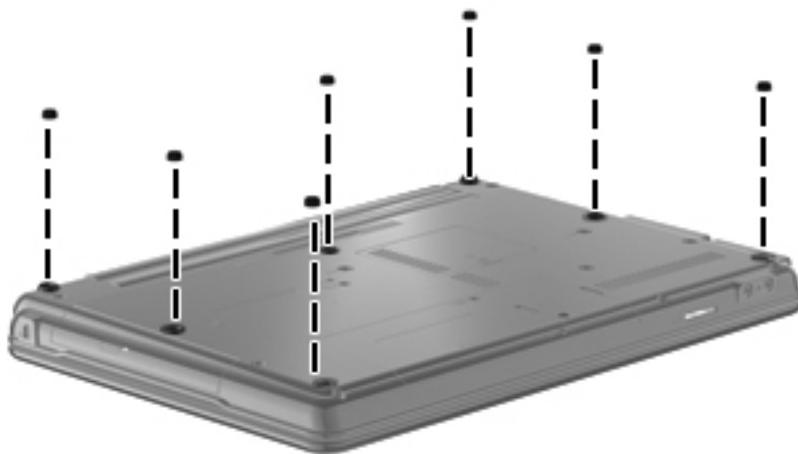
When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag.



Item	Component	Description
①	Product name	This is the product name affixed to the front of the computer.
②	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
③	Part number/Product number (p/n)	This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
④	Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.
⑤	Warranty period	This number describes the duration of the warranty period for the computer.

## Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 538448-001. There are 7 rubber feet that attach to the base enclosure in the locations illustrated below.



## Battery

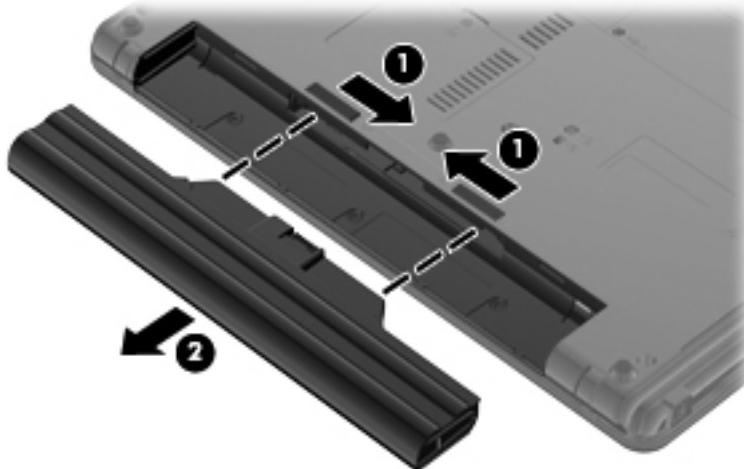
Description	Spare part number
For use only on computer models equipped with an AMD processor:	
■ 8-cell, 2.55-Ah (63-Wh) Li-ion battery	572188-001
■ 6-cell, 2.20-Ah (47-Wh) Li-ion battery	572187-001
For use only on computer models equipped with an Intel processor:	
■ 8-cell, 2.55-Ah (63-Wh) Li-ion battery	572191-001
■ 6-cell, 2.20-Ah (47-Wh) Li-ion battery	572190-001

Before removing the battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

Remove the battery:

1. Turn the computer upside down on a flat surface, with the battery bay toward you.
2. Slide the battery release latches **1** to release the battery.
3. Remove the battery **2** from the computer.



Install the battery by inserting it into the battery bay until you hear a click.

## Hard drive



The hard drive spare part kit includes a hard drive connector and hard drive bracket.

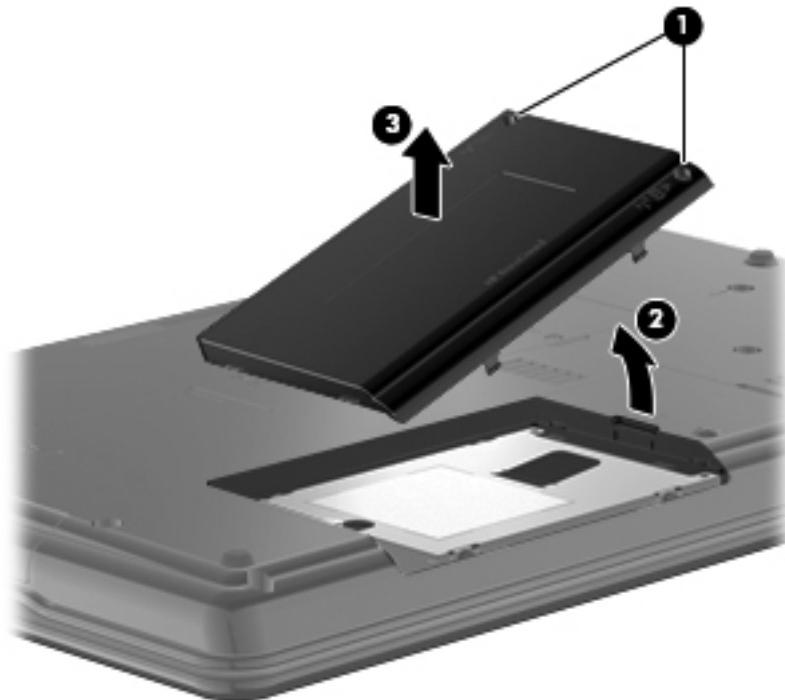
Description	Spare part number
For use only on computer models equipped with an AMD processor:	
■ 500-GB, 5400-rpm	538405-001
■ 320-GB, 5400-rpm	538404-001
■ 250-GB, 7200-rpm	575199-001
■ 250-GB, 5400-rpm	538403-001
■ 160-GB, 7200-rpm	575198-001
■ 160-GB, 5400-rpm	538402-001
For use only on computer models equipped with an Intel processor:	
■ 500-GB, 5400-rpm	538440-001
■ 320-GB, 5400-rpm	538439-001
■ 250-GB, 7200-rpm	575197-001
■ 250-GB, 5400-rpm	538438-001
■ 160-GB, 7200-rpm	575196-001
■ 160-GB, 5400-rpm	538437-001

Before removing the hard drive, follow these steps:

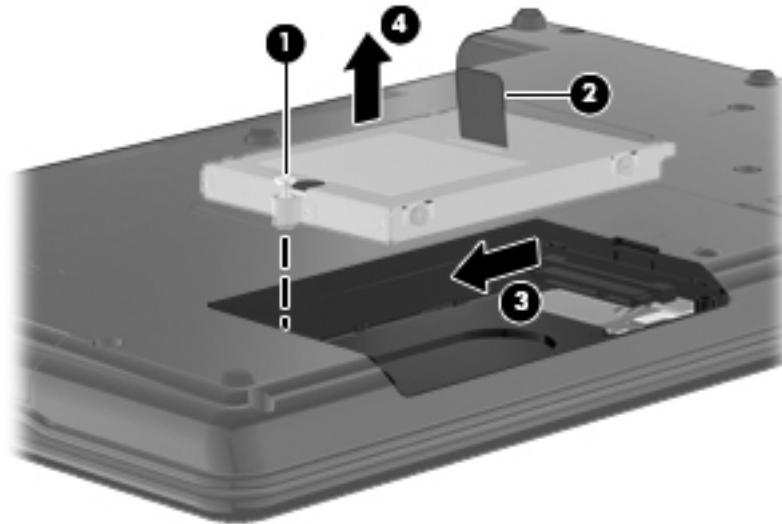
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).

Remove the hard drive:

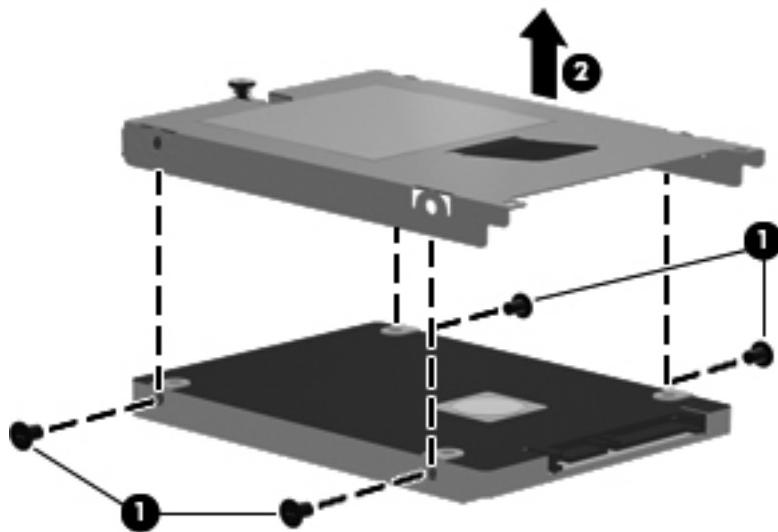
1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.0×6.0 captive screws **1** that secure the hard drive cover to the computer.
3. Lift the right side **2** of the hard drive cover to detach it from the computer.
4. Remove the hard drive cover **3**. The hard drive cover is included in the Plastics Kit, spare part number 538450-001.



5. Loosen the Phillips PM2.5×11.0 captive screw **1** that secures the hard drive in the hard drive bay.
6. Grasp the Mylar tab **2** on the hard drive and slide the hard drive **3** to the left.
7. Remove the hard drive **4** from the hard drive bay.



8. If it is necessary to replace the hard drive bracket, follow these steps:
  - a. Remove the two Phillips PM3.0x4.0 screws **1** from each side of the hard drive.
  - b. Lift the bracket **2** straight up to remove it from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

## WLAN module

Description	Spare part number
<b>802.11a/b/g/n WLAN module for use with all computer models:</b>	
■ Broadcom 4322AGN 802.11a/b/g/n WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	518434-001
■ Broadcom 4322AGN 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	518434-002

(Continued)

Description	Spare part number
<b>802.11a/b/g WLAN modules for use on all computer models:</b>	
■ Broadcom 4312G 802.11a/b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504593-003
■ Broadcom 4312G 802.11a/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004
<b>802.11a/b/g WLAN modules for use only on computer models equipped with an Intel processor:</b>	
■ Intel PRO/wireless 3945 802.11a/b/g WLAN module for use in Antigua and Barbuda, Argentina, Australia, the Bahamas, Barbados, Brunei, Canada, Chile, the Dominican Republic, Guam, Guatemala, Hong Kong, India, Indonesia, Malaysia, Mexico, New Zealand, Panama, Paraguay, Saudi Arabia, Taiwan, the United States, and Vietnam	451861-001
■ Intel PRO/wireless 3945 802.11a/b/g WLAN module for use in Aruba, Austria, Azerbaijan, Bahrain, Belgium, Bermuda, Brazil, Bulgaria, the Cayman Islands, Colombia, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Jordan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Montenegro, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Romania, Russia, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, the United Kingdom, and Uzbekistan	451861-002
■ Intel PRO/wireless 3945 802.11a/b/g WLAN module for use in Ecuador, Haiti, Honduras, Pakistan, the People's Republic of China, Peru, Qatar, Uruguay, and Venezuela	451861-003
■ Intel PRO/wireless 3945 802.11a/b/g WLAN module for use in Japan	407575-291
■ Intel PRO/wireless 3945 802.11a/b/g WLAN module for use in South Korea	409280-004

Before removing the WLAN module, follow these steps:

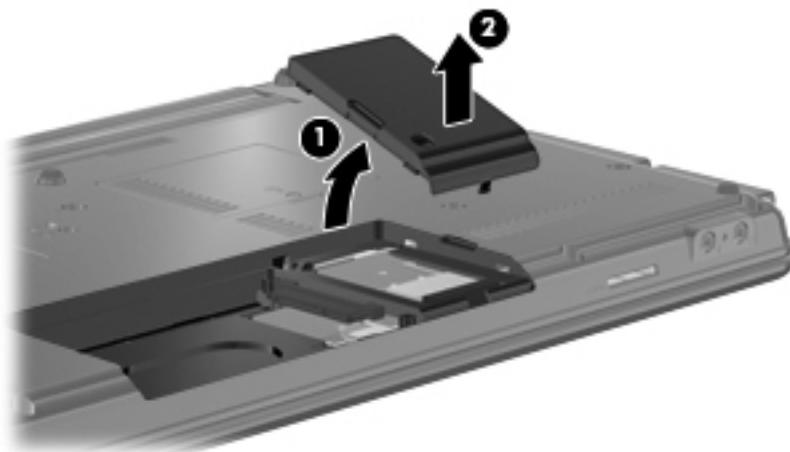
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).

Remove the WLAN module:



**CAUTION:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.

1. Position the computer with the front toward you.
2. Lift the rear edge **1** of the wireless module compartment cover to detach it from the computer.
3. Remove the wireless module compartment cover **2**. The wireless module compartment cover is included in the Plastics Kit, spare part number 538450-001.



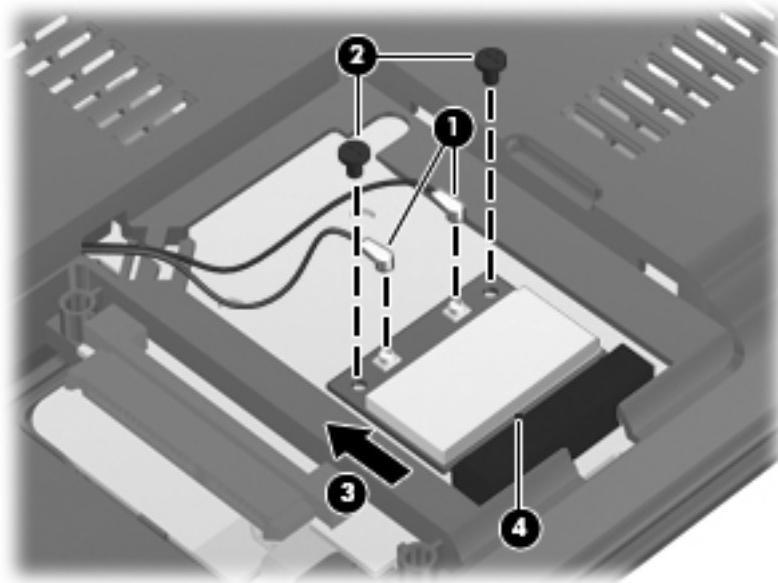
4. Disconnect the WLAN antenna cables **1** from the terminals on the WLAN module.

 The black WLAN antenna cable is connected to the WLAN module “Main” terminal. The white WLAN antenna cable is connected to the WLAN module “Aux” terminal.

5. Remove the two Phillips PM2.5×4.0 screws **2** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

6. Remove the WLAN module **3** by pulling the module away from the slot at an angle.

 WLAN modules are designed with a notch **4** to prevent incorrect insertion of the WLAN module into the WLAN module slot.



Reverse this procedure to install the WLAN module.

## Memory module

Description	Spare part number
For use only on computer models equipped with an AMD processor:	
■ 2048-MB (800-MHz, DDR2)	538401-001
■ 1024-MB (800-MHz, DDR2)	538400-001
■ 512-MB (800-MHz, DDR2)	538399-001
■ 1024-MB (667-MHz, DDR2)	538397-001
■ 512-MB (667-MHz, DDR2)	538396-001
For use only on computer models equipped with an Intel processor:	
■ 2048-MB (800-MHz, DDR2)	538436-001
■ 1024-MB (800-MHz, DDR2)	538435-001
■ 512-MB (800-MHz, DDR2)	538434-001
■ 2048-MB (667-MHz, DDR2)	538433-001
■ 1024-MB (667-MHz, DDR2)	538432-001
■ 512-MB (667-MHz, DDR2)	538431-001

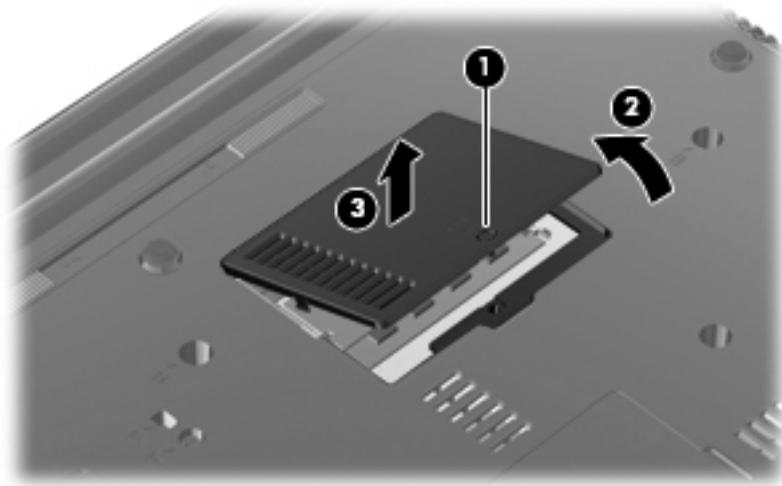
Before removing the memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).

Remove the memory module:

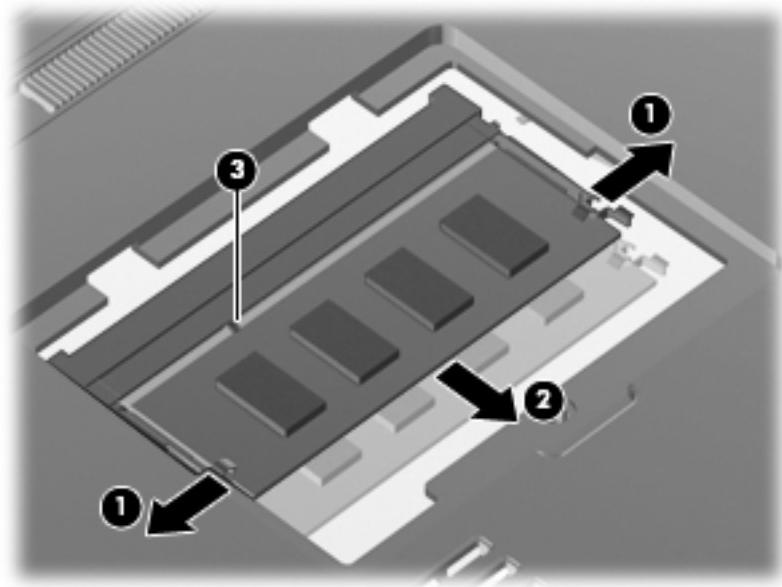
 The top memory module slot is for expansion memory and the bottom slot is for primary memory.

1. Position the computer with the front toward you.
2. Loosen the Phillips PM2.0×6.0 captive screw **1** that secures the memory module compartment cover to the computer.
3. Lift the front edge **2** of the memory module compartment cover to detach it from the computer.
4. Remove the memory module compartment cover **3**. The memory module compartment cover is included in the Plastics Kit, spare part number 538450-001.



5. Spread the retaining tabs **1** on each side of the memory module to release the memory module. (The edge of the module opposite the slot rises away from the computer.)
6. Remove the memory module **2** by pulling the module away from the slot at an angle.

 Memory modules are designed with a notch **3** to prevent incorrect insertion into the memory module slot.



Reverse this procedure to install a memory module.

## Optical drive

 The optical drive spare part kit includes an optical drive bezel and bracket.

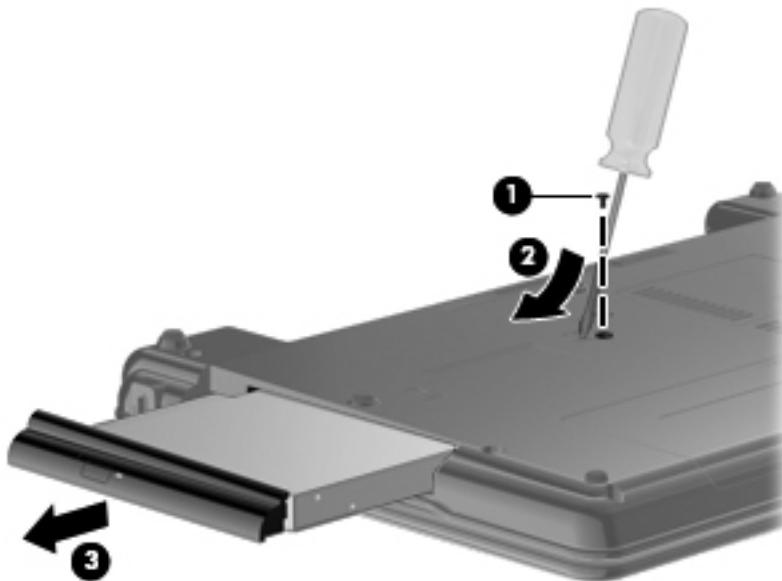
Description	Spare part number
For use only on computer models equipped with an AMD processor:	
■ DVD±RW and CD-RW SuperMulti Double-Layer Drive with LightScribe	538406-001
■ DVD-ROM Drive	575200-001
For use only on computer models equipped with an Intel processor:	
■ DVD±RW and CD-RW SuperMulti Double-Layer Drive with LightScribe	538442-001
■ DVD-ROM Drive	538441-001

Before removing the optical drive, follow these steps:

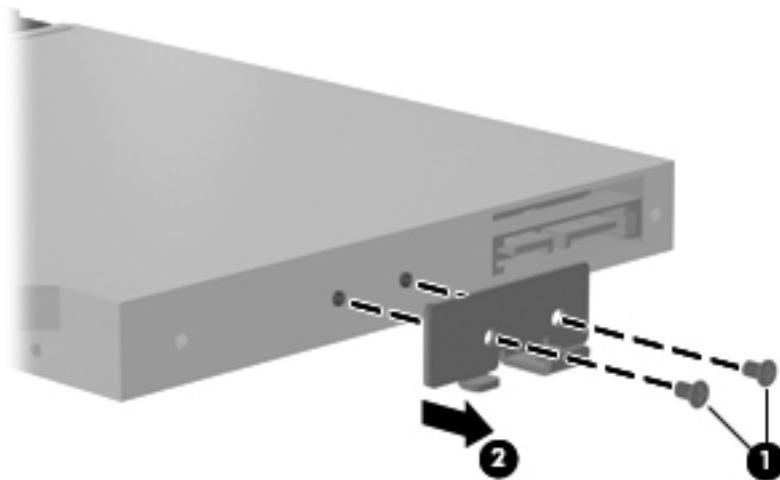
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).

Remove the optical drive:

1. Position the computer with the front toward you.
2. Remove the Phillips PM2.5×8.0 screw **1** that secures the optical drive to the computer.
3. Insert a flat-bladed screwdriver or similar tool into the optical drive tab access **2** and press the tab to the left to release the optical drive from the computer.
4. Remove the optical drive **3** from the optical drive bay.



5. If it is necessary to replace the optical drive bracket, follow these steps:
  - a. Position the optical drive with the rear toward you.
  - b. Remove the two Phillips PM2.0×3.0 screws **1** that secure the optical drive bracket to the optical drive.
  - c. Remove the optical drive bracket **2**.



Reverse this procedure to reassemble and install the optical drive.

## Keyboard and switch cover

For use in country or region:	Spare part number	For use in country or region:	Spare part number
■ For use in Belgium	539682-A41	■ For use in Norway	539682-091
■ For use in Brazil	539682-201	■ For use in Portugal	539682-131
■ For use in Bulgaria	539682-261	■ For use in Russia	539682-251
■ For use in the Czech Republic	539682-221	■ For use in Saudi Arabia	539682-171
■ For use in Denmark	539682-081	■ For use in Slovakia	539682-231
■ For use in France	539682-051	■ For use in Slovenia	539682-BA1
■ For use in French Canada	539682-121	■ For use in South Korea	539682-AD1
■ For use in Germany	539682-041	■ For use in Spain	539682-071
■ For use in Greece	539682-DJ1	■ For use in Sweden and Finland	539682-B71
■ For use in Hungary	539682-211	■ For use in Switzerland	539682-BG1
■ For use in Iceland	539682-DD1	■ For use in Taiwan	539682-AB1
■ For use in Israel	539682-BB1	■ For use in Thailand	539682-281
■ For use in Italy	539682-061	■ For use in Turkey	539682-141
■ For use in Japan	539682-291	■ For use in the United Kingdom	539682-031
■ For use in Latin America	539682-161	■ For use in the United States	539682-001
■ For use in the Netherlands	539682-B31		

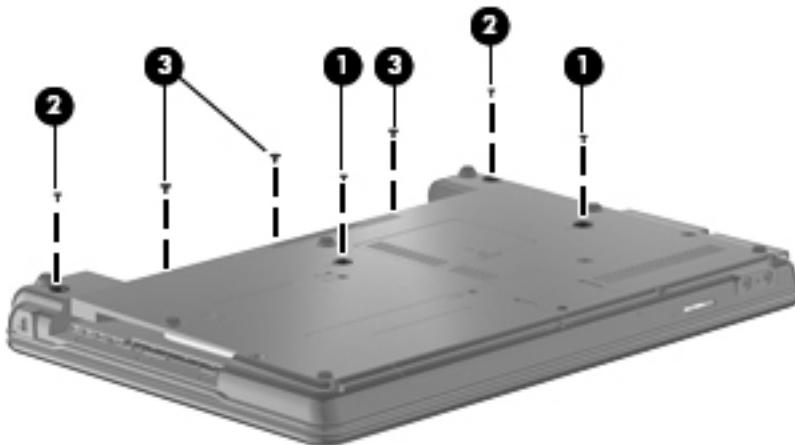
Description	Spare part number
Switch cover (includes power button board and cable)	538452-001

Before removing the keyboard and switch cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).

Remove the keyboard and switch cover:

1. Position the computer with the front toward you.
2. Remove the following screws:
  - ➊ Two Phillips PM2.5×8.0 screws that secure the keyboard to the computer
  - ➋ Two slotted Torx T8M2.5×8.0 screws that secure the switch cover to the computer
  - ➌ Three Phillips PM2.0×3.0 broadhead screws that secure the switch cover to the computer



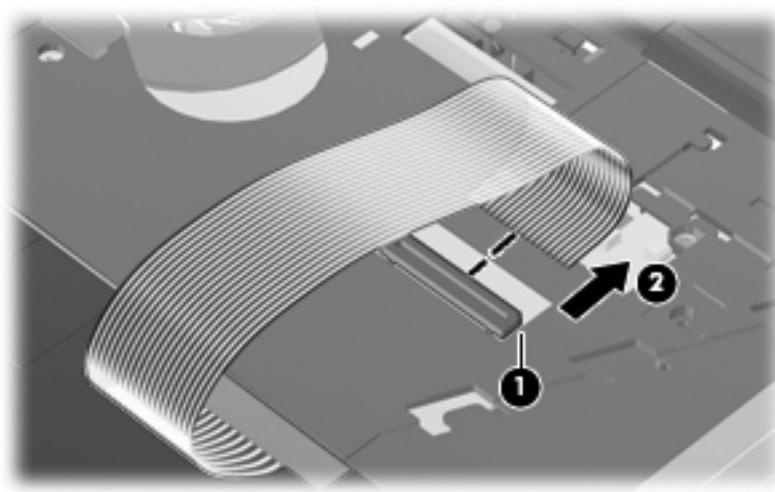
3. Turn the computer display-side up with the front toward you.
4. Open the computer as far as possible.
5. Lift the rear edge **1** of the switch cover until it rests at an angle.
6. Slide the switch cover **2** back until it rests on the display.



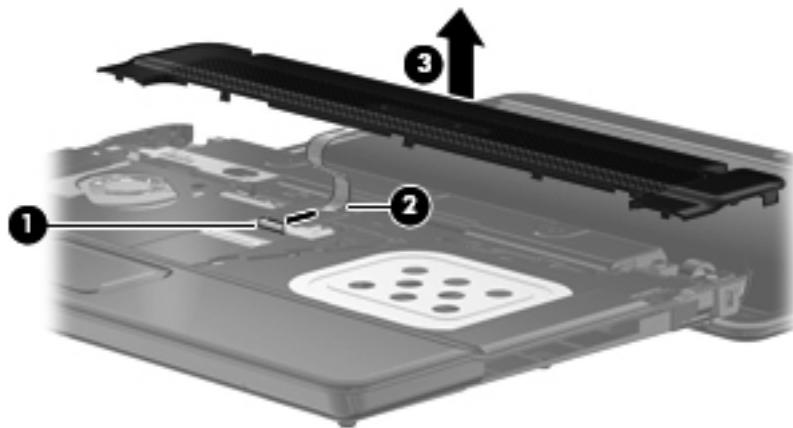
7. Lift the rear edge **1** of the keyboard until it rests at an angle.
8. Slide the keyboard **2** back until it rests on the switch cover and display.



9. Release the zero insertion force (ZIF) connector **1** to which the keyboard cable is attached, and disconnect the keyboard cable **2** from the system board.



10. Remove the keyboard.
11. Release the ZIF connector **1** to which the power button board cable is attached, and disconnect the power button board cable **2** from the system board.
12. Remove the switch cover **3**.



Reverse this procedure to install the keyboard and switch cover.

## Speaker

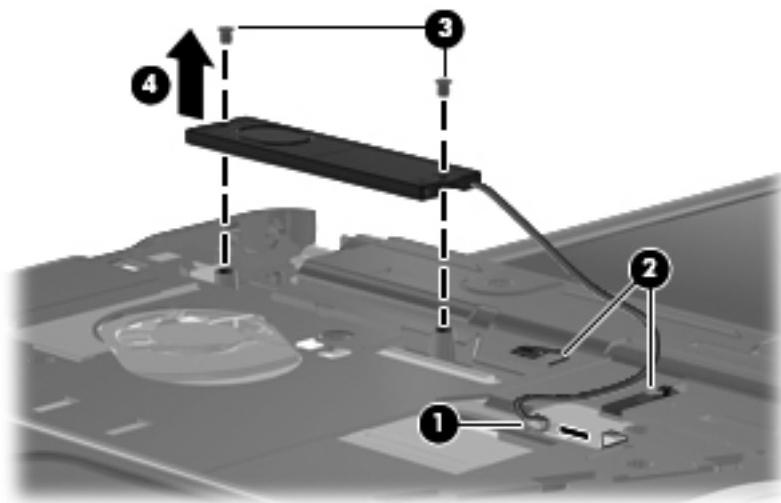
Description	Spare part number
Speaker	538453-001

Before removing the speaker, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Remove the keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20).

Remove the speaker:

1. Disconnect the speaker cable **①** from the system board.
2. Release the speaker cable from the clips **②** built into the top cover.
3. Remove the two Phillips PM2.5×4.0 screws **③** that secure the speaker to the top cover.
4. Remove the speaker **④**.



Reverse this procedure to install the speaker.

## Display assembly

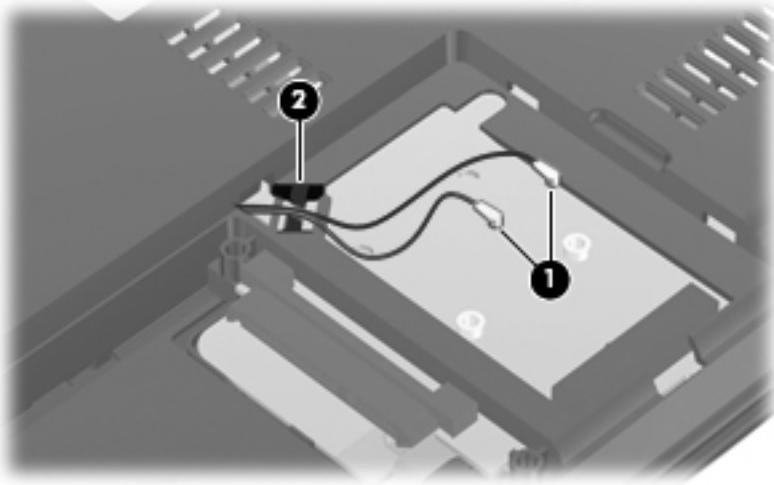
Description	Spare part number
15.6-in, SVA, HD display assembly (includes 2 WLAN antenna transceivers and cables, nameplate, and logo):	
For use only on computer models equipped with an AMD processor:	
■ AntiGlare display assembly for use only on computer models equipped with a webcam	572529-001
■ AntiGlare display assembly for use only on computer models not equipped with a webcam	572527-001
■ BrightView display assembly for use only on computer models equipped with a webcam	572530-001
■ BrightView display assembly for use only on computer models not equipped with a webcam	572528-001
For use only on computer models equipped with an Intel processor:	
■ AntiGlare display assembly for use only on computer models equipped with a webcam	538423-001
■ AntiGlare display assembly for use only on computer models not equipped with a webcam	538421-001
■ BrightView display assembly for use only on computer models equipped with a webcam	538424-001
■ BrightView display assembly for use only on computer models not equipped with a webcam	538422-001

Before removing the display assembly, follow these steps:

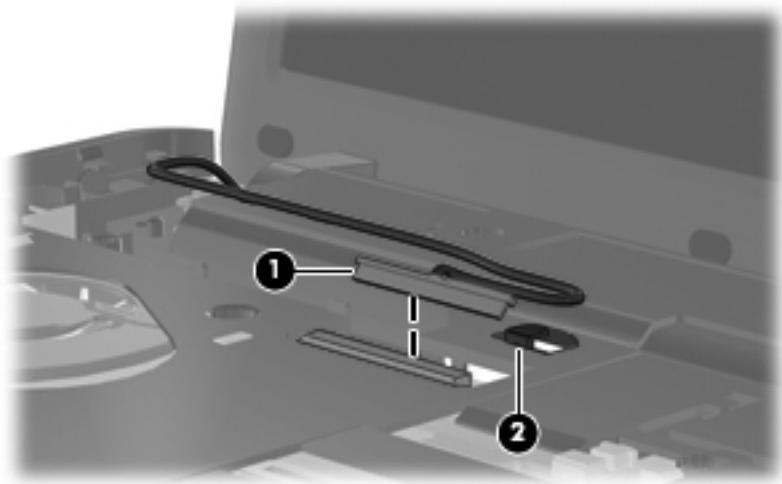
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Disconnect the wireless antenna cables from the WLAN module (see “[WLAN module](#)” on page 4-12).
6. Remove the keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20).
7. Remove the speaker (see “[Speaker](#)” on page 4-24).

Remove the display assembly:

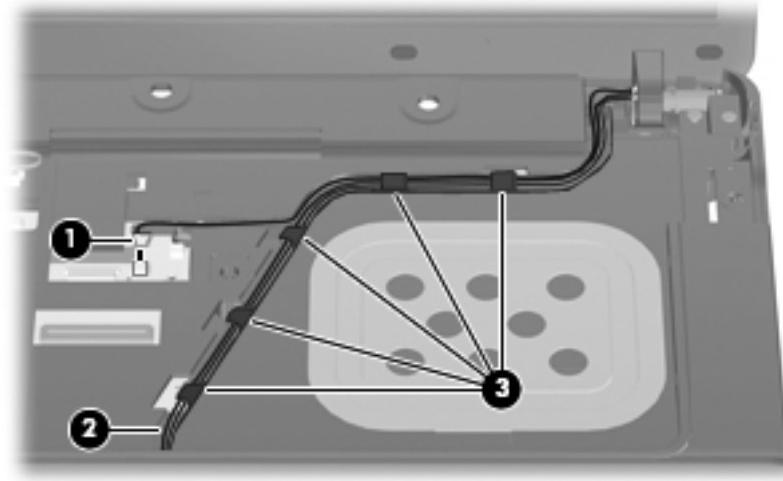
1. Close the computer.
2. Turn the computer upside down with the front toward you.
3. Remove the WLAN antenna cables **1** from the clip **2** built into the base enclosure.



4. Turn the computer display-side up with the front toward you.
5. Open the computer as far as possible.
6. Disconnect the display panel cable **1** from the system board.
7. Release the display panel cable from the clip **2** built into the top cover.

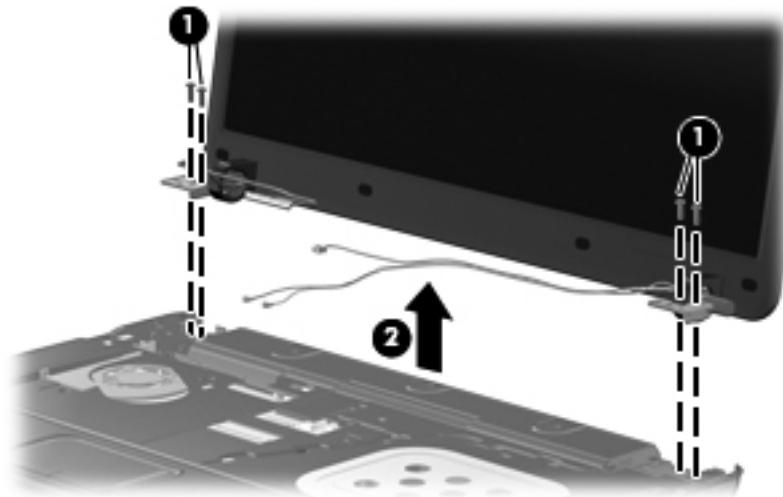


8. Disconnect the webcam module cable **1** from the system board.
9. Remove the wireless antenna cables **2** and the microphone cable from the clips **3** and routing channel built into the top cover.



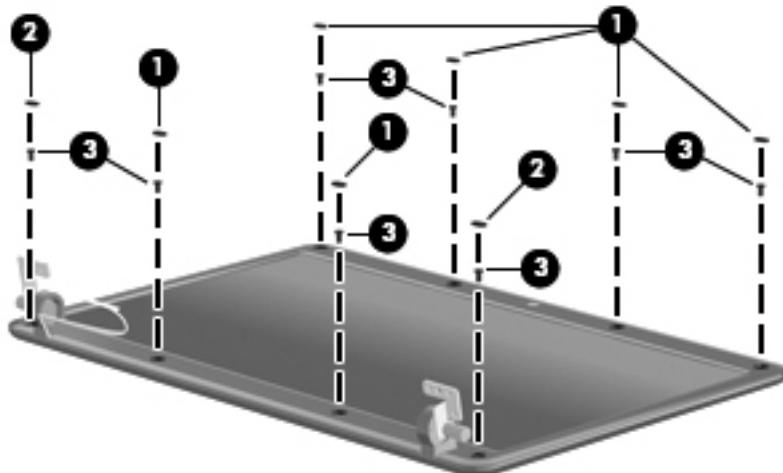
**CAUTION:** Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

10. Remove the four Phillips PM2.5×6.0 screws **1** that secure the display assembly to the computer.
11. Lift the display assembly **2** straight up and remove it.



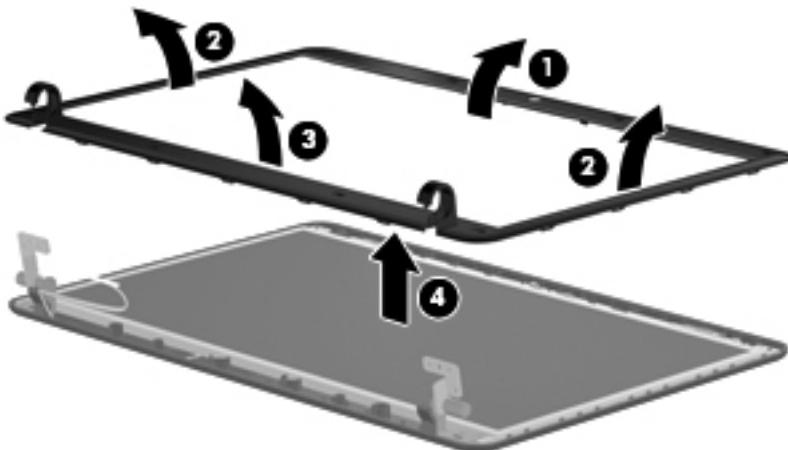
12. If it is necessary to replace the display bezel or any of the display assembly internal components, remove the eight rubber screw covers **1** and **2** and the eight Phillips PM2.5×6.0 screws **3**.

 The rubber screw covers **1** on the display bezel top edge and bottom inside edge are larger than the rubber screw covers **2** on the display bezel bottom outside corners. The rubber screw covers are included in the Rubber Kit, spare part number 538448-001.

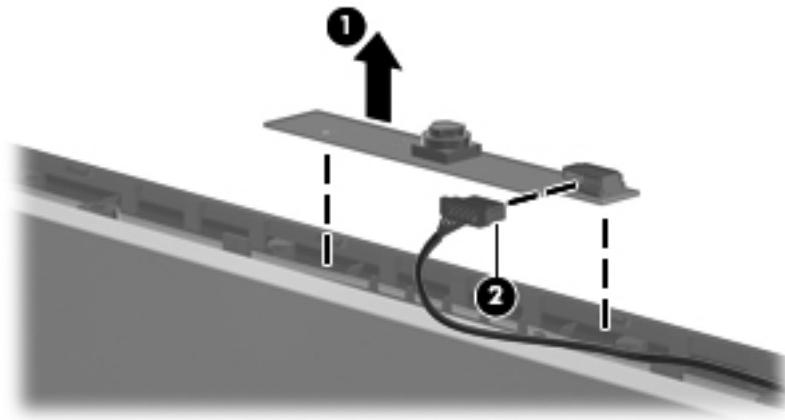


13. Flex the inside edges of the top edge **1**, the left and right sides **2**, and the bottom edge **3** of the display bezel until the bezel disengages from the display enclosure.
14. Remove the display bezel **4**. The display bezel is available using the following spare part numbers:

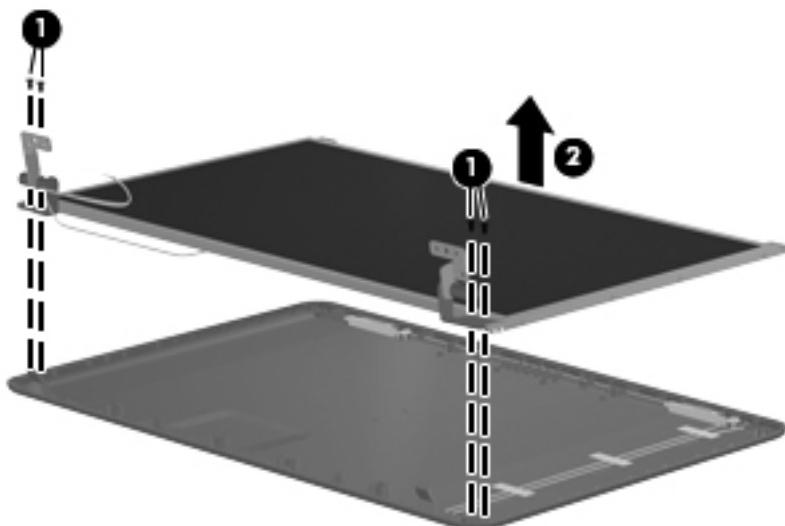
- 538428-001—for use only on computer models equipped with a webcam
- 538427-001—for use only on computer models not equipped with a webcam



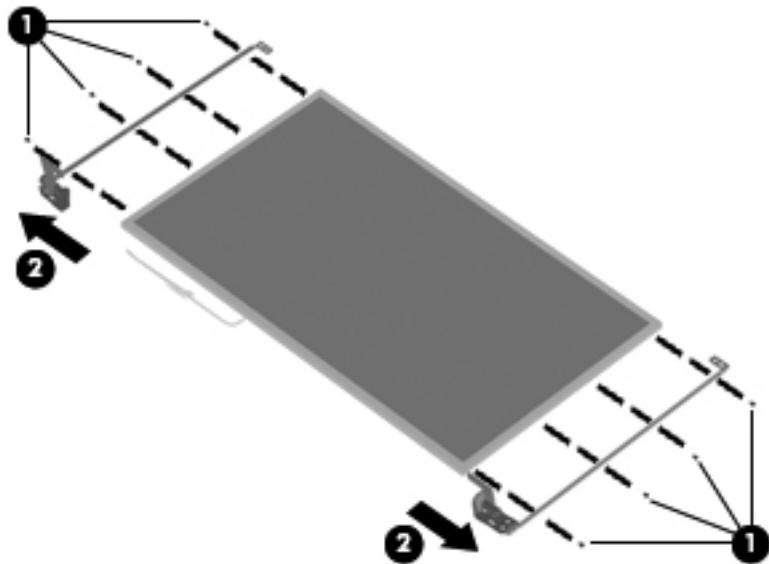
15. If it is necessary to replace the webcam module, release the webcam module **①** as far from the display enclosure as the webcam module cable allows.
16. Disconnect the webcam module cable **②** from the webcam module.



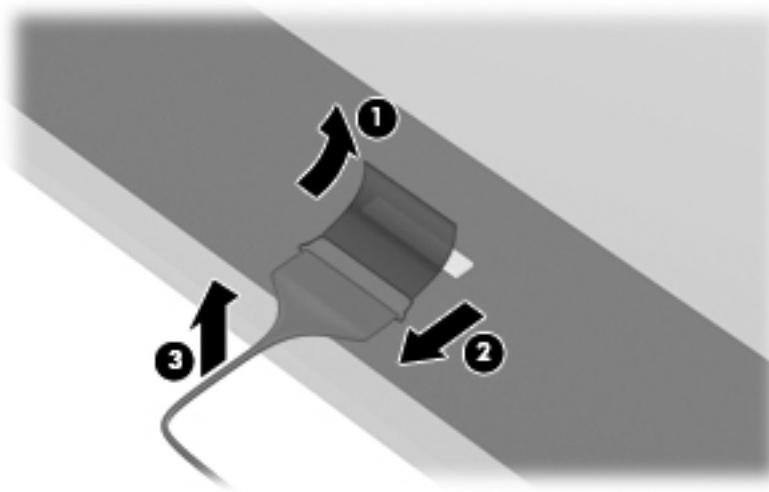
17. Remove the webcam module. The webcam module is available using spare part number 538443-001.
18. If it is necessary to replace the display hinges, remove four Phillips PM2.5×5.0 screws **①** that secure the display panel to the display enclosure.
19. Remove the display panel **②** from the display enclosure.



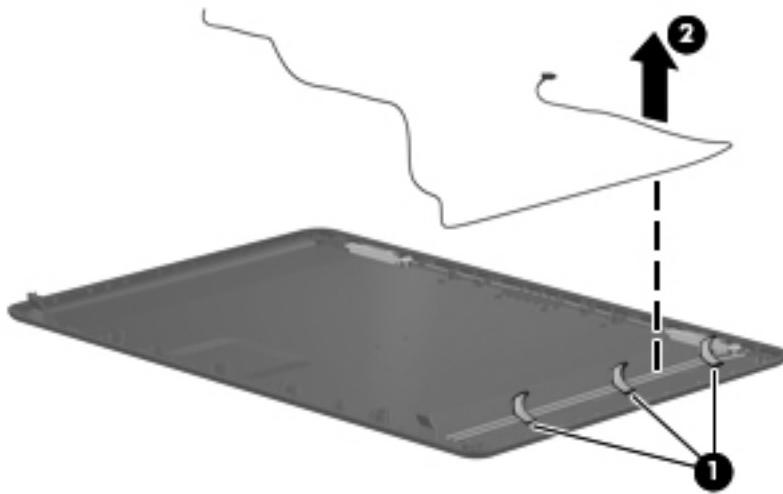
20. If it is necessary to replace the display hinges, remove the eight Phillips PM2.0×3.0 screws ① that secure the hinges to the display panel.
21. Remove the display hinges ②. The display hinges are available using spare part number 538462-001.



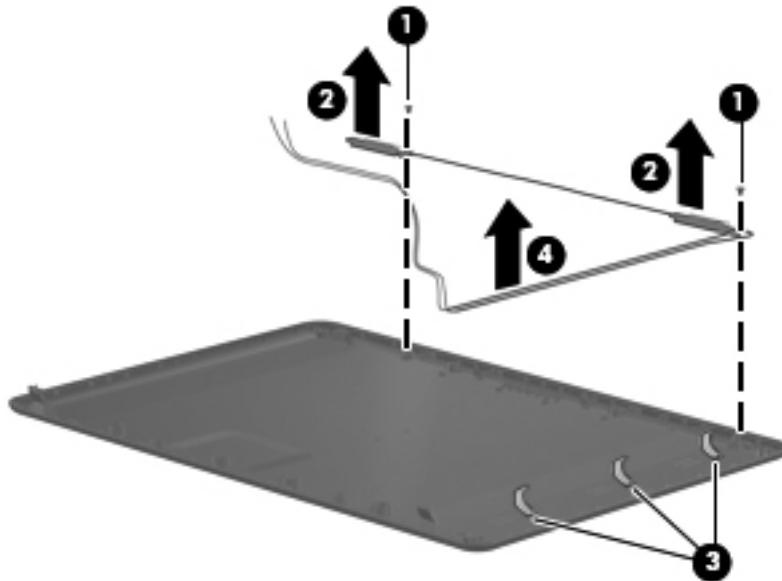
22. If it is necessary to replace the display panel cable, turn the display panel upside down with the bottom edge toward you.
23. Release the adhesive support strip ① that secures the display panel cable to the display panel.
24. Disconnect the display panel cable ② from the connector on the back of the display panel.
25. Remove the display panel cable ③. The display panel cable is included in the Display Cable Kit, spare part number 538463-001.



26. If it is necessary to replace the webcam module cable, release the tabs **1** built into the display enclosure shielding.
27. Remove the webcam module cable **2**. The webcam module cable is included in the Display Cable Kit, spare part number 538463-001.



28. If it is necessary to replace the wireless antenna transceivers and cables, remove the Phillips PM2.5×4.0 screws **1** that secure the transceivers to the display enclosure.
29. Release the transceivers **2** from the display enclosure. The transceivers are attached to the enclosure with double-sided tape.
30. Release the tabs **3** built into the display enclosure shielding.
31. Remove the wireless antenna transceivers and cables **4**. The wireless antenna transceivers and cables are included in the Display Cable Kit, spare part number 538463-001.



Reverse this procedure to reassemble and install the display assembly.

## Top cover

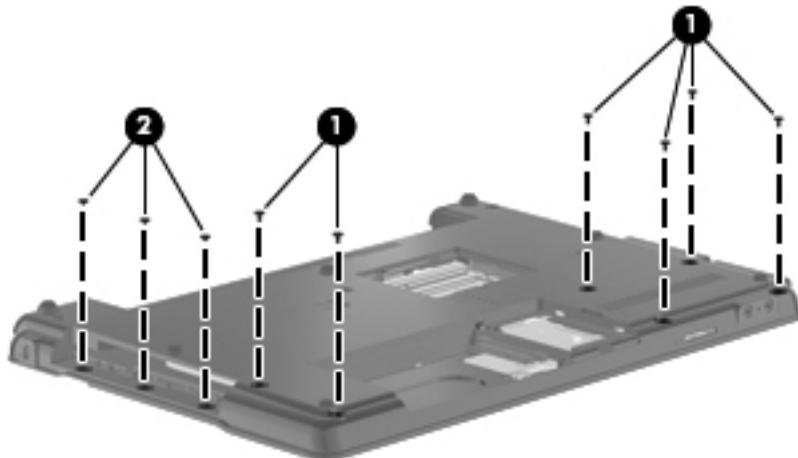
Description	Spare part number
Top cover (includes TouchPad on/off board and cable, TouchPad button board and cable, and TouchPad board and cable)	538447-001

Before removing the top cover, follow these steps:

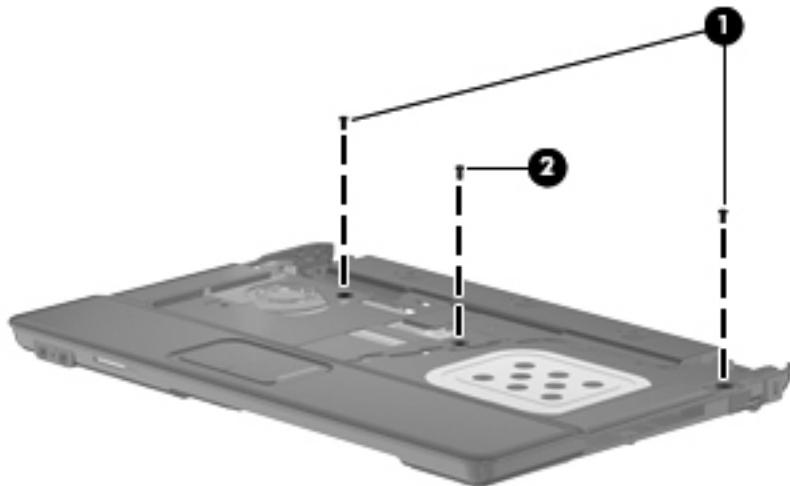
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Remove the following components:
  - a. Hard drive (see “[Hard drive](#)” on page 4-8)
  - b. Optical drive (see “[Optical drive](#)” on page 4-18)
  - c. Keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20)
  - d. Speaker (see “[Speaker](#)” on page 4-24)
  - e. Display assembly (see “[Display assembly](#)” on page 4-25)

Remove the top cover:

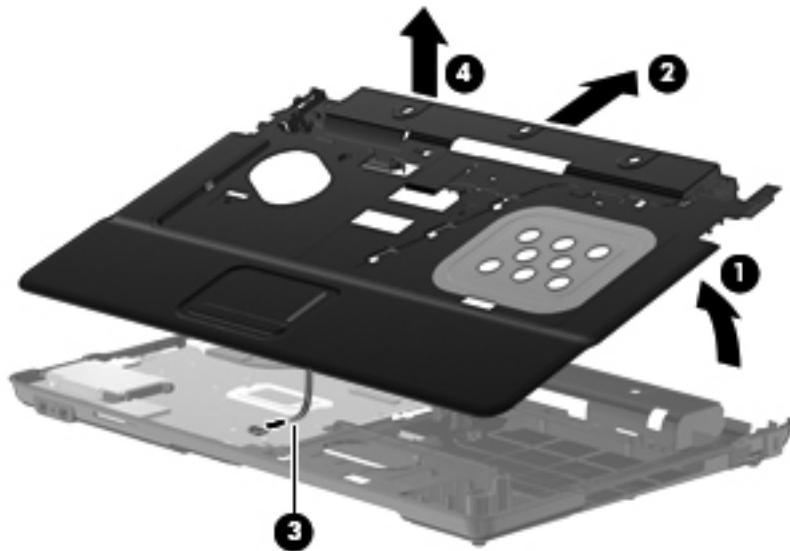
1. Turn the computer upside down with the front toward you.
2. Remove the six slotted Torx T8M2.5×8.0 screws **1** and the three Phillips PM2.0×4.0 broadhead screws **2** that secure the top cover to the base enclosure.



3. Turn the computer right-side up with the front toward you.
4. Remove the two Phillips PM2.5×6.0 screws **1** and the Phillips PM2.0×4.0 screw **2** that secure the top cover to the base enclosure.



5. Lift the rear edge **1** of the top cover until it rests at an angle.
6. Slide the top cover **2** back at an angle until the TouchPad cable **3** is accessible.
7. Disconnect the TouchPad cable from the system board.
8. Remove the top cover **4** by lifting it straight up.



Reverse this procedure to install the top cover.

## Bluetooth module

 The Bluetooth module spare part kits do not include a Bluetooth module cable. The Bluetooth module cables are included in the Cable Kit, spare part number 538465-001.

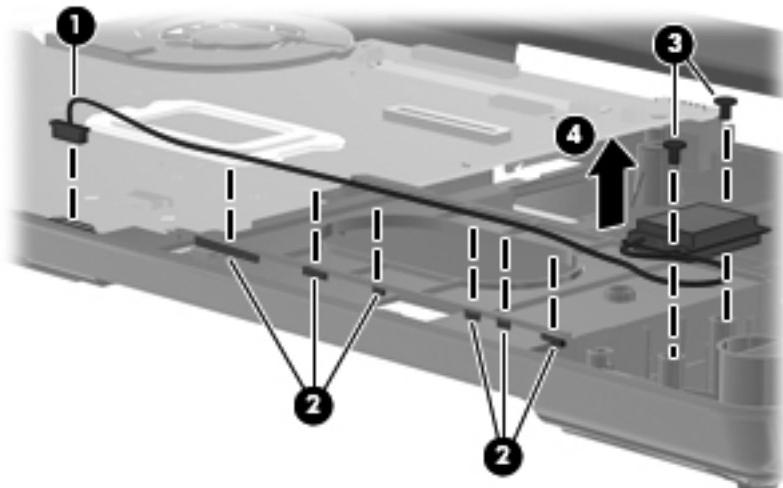
Description	Spare part number
Full-sized Bluetooth module	398393-002
Reduced form factor Bluetooth module	537921-001

Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Remove the following components:
  - a. Hard drive (see “[Hard drive](#)” on page 4-8)
  - b. Optical drive (see “[Optical drive](#)” on page 4-18)
  - c. Keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20)
  - d. Speaker (see “[Speaker](#)” on page 4-24)
  - e. Display assembly (see “[Display assembly](#)” on page 4-25)
  - f. Top cover (see “[Top cover](#)” on page 4-32)

Remove the Bluetooth module and cable:

1. Disconnect the Bluetooth module cable ① from the system board.
2. Remove the Bluetooth module cable from the clips ② and routing channel built into the base enclosure.
3. Remove the Phillips PM2.0×3.0 screws ③ that secure the Bluetooth module to the base enclosure.
4. Remove the Bluetooth module and cable ④.



Reverse this procedure to install the Bluetooth module.

## System board and optical drive connector board



The system board spare part kit includes replacement thermal material.

Description	Spare part number
For use only on computer models equipped with an AMD processor:	
■ For use only on computer models equipped with a graphics subsystem with discrete memory	538392-001
■ For use only on computer models equipped with a graphics subsystem with UMA memory	538391-001
For use only on computer models equipped with an Intel processor:	
■ For use only on computer models equipped with a graphics subsystem with discrete memory	538408-001
■ GL system board for use only on computer models equipped with a graphics subsystem with UMA memory	538407-001
■ GM system board for use only on computer models equipped with a graphics subsystem with UMA memory	538409-001

Before removing the system board, follow these steps:

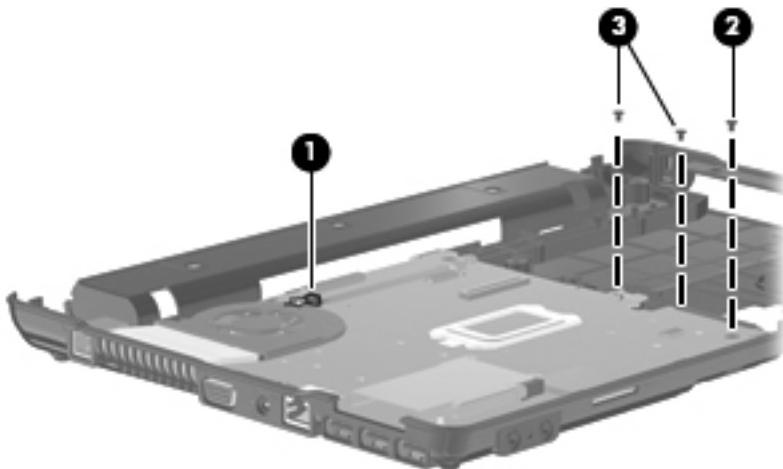
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Remove the following components:
  - a. Hard drive (see “[Hard drive](#)” on page 4-8)
  - b. Optical drive (see “[Optical drive](#)” on page 4-18)
  - c. Keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20)
  - d. Speaker (see “[Speaker](#)” on page 4-24)
  - e. Display assembly (see “[Display assembly](#)” on page 4-25)
  - f. Top cover (see “[Top cover](#)” on page 4-32)
6. Disconnect the Bluetooth module cable from the system board (see “[Bluetooth module](#)” on page 4-34).

When replacing the system board, be sure that the following additional components are removed from the defective system board and installed on the replacement system board:

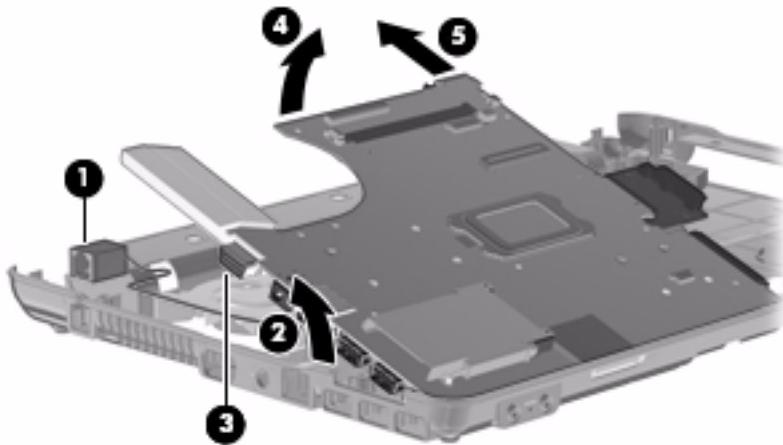
- WLAN module (see “[WLAN module](#)” on page 4-12)
- Memory modules (see “[Memory module](#)” on page 4-16)
- RTC battery (see “[RTC battery](#)” on page 4-40)
- Modem module (see “[Modem module](#)” on page 4-42)
- Heat sink (see “[Heat sink](#)” on page 4-44)
- Modem module cable (see “[Modem module cable](#)” on page 4-48)
- Processor (see “[Processor](#)” on page 4-49)

Remove the system board:

1. Disconnect the fan cable **1** from the system board.
2. Remove the Phillips PM2.5×4.0 screw **2** that secures the system board to the base enclosure.
3. Remove the two Phillips PM2.5×4.0 screws **3** that secure the optical drive connector board to the base enclosure.



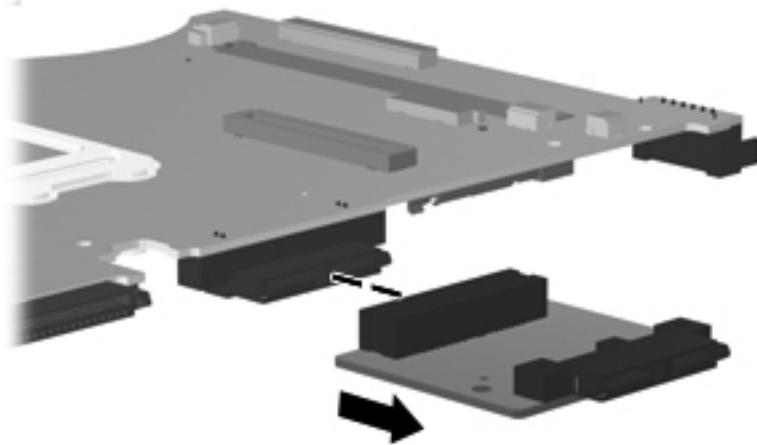
4. Release the RJ-11 connector **1** from the clip built into the base enclosure.
5. Flex the left side of the base enclosure **2** until the external monitor connector **3** is clear of the opening of the base enclosure.
6. Lift the rear edge of the system board **4** until it rests at an angle.
7. Remove the system board **5** by sliding it back.





**CAUTION:** Do not attempt to remove the optical drive connector board until after the system board has been removed from the base enclosure. Failure to follow this caution can result in damage to the system board, the base enclosure, and the optical drive connector board.

8. If it is necessary to replace the optical drive connector board, disconnect the board from the system board. The optical drive connector board is available using spare part number 538460-001.



Reverse this procedure to install the system board and optical drive connector board.

## Fan

Description	Spare part number
Fan	538455-001

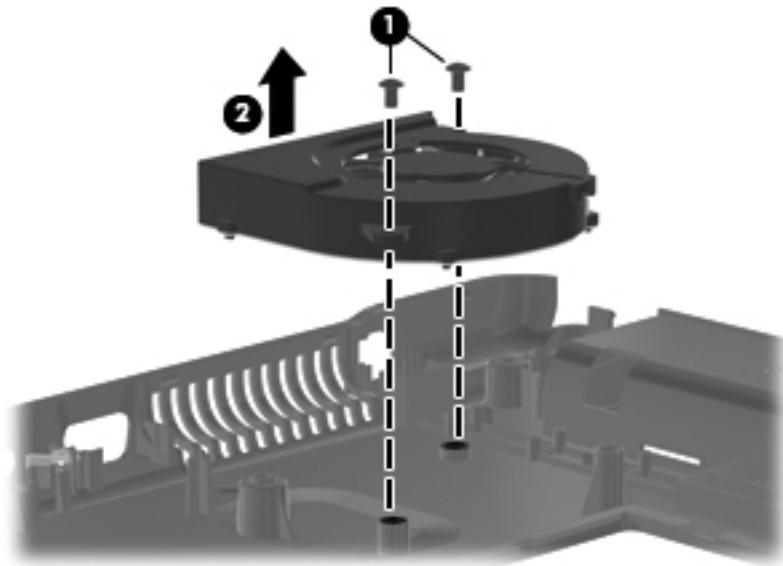
 To properly ventilate the computer, allow at least a 7.6-cm (3-in) clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

Before removing the fan, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Remove the following components:
  - a. Hard drive (see “[Hard drive](#)” on page 4-8)
  - b. Optical drive (see “[Optical drive](#)” on page 4-18)
  - c. Keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20)
  - d. Speaker (see “[Speaker](#)” on page 4-24)
  - e. Display assembly (see “[Display assembly](#)” on page 4-25)
  - f. Top cover (see “[Top cover](#)” on page 4-32)
  - g. System board (see “[System board and optical drive connector board](#)” on page 4-35)

Remove the fan:

1. Remove the two Phillips PM2.5×6.0 screws **1** that secure the fan to the base enclosure.
2. Remove the fan **2**.



Reverse this procedure to install the fan.

## RTC battery

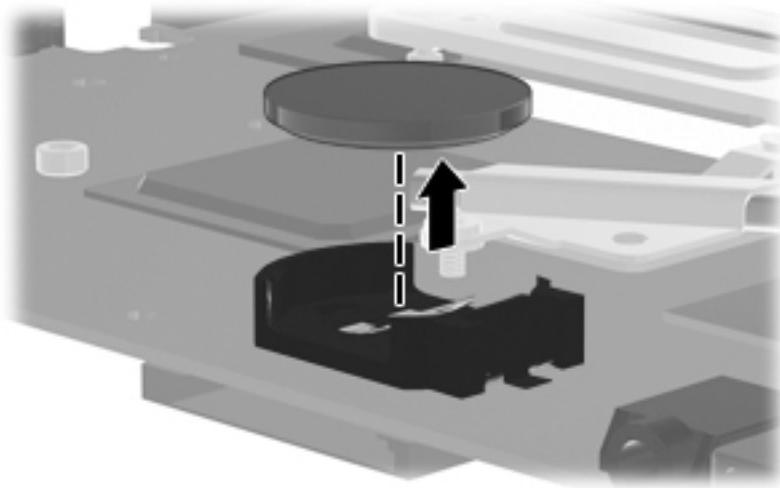
Description	Spare part number
RTC battery	449137-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Remove the following components:
  - a. Hard drive (see “[Hard drive](#)” on page 4-8)
  - b. Optical drive (see “[Optical drive](#)” on page 4-18)
  - c. Keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20)
  - d. Speaker (see “[Speaker](#)” on page 4-24)
  - e. Display assembly (see “[Display assembly](#)” on page 4-25)
  - f. Top cover (see “[Top cover](#)” on page 4-32)
  - g. System board (see “[System board and optical drive connector board](#)” on page 4-35)

Remove the RTC battery:

1. Turn the system board upside down with the front toward you.
2. Remove the RTC battery from the socket on the system board.



Reverse this procedure to install the RTC battery.

## Modem module

 The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 538465-001. See “[Modem module cable](#)” on page 4-48 for modem module cable removal information.

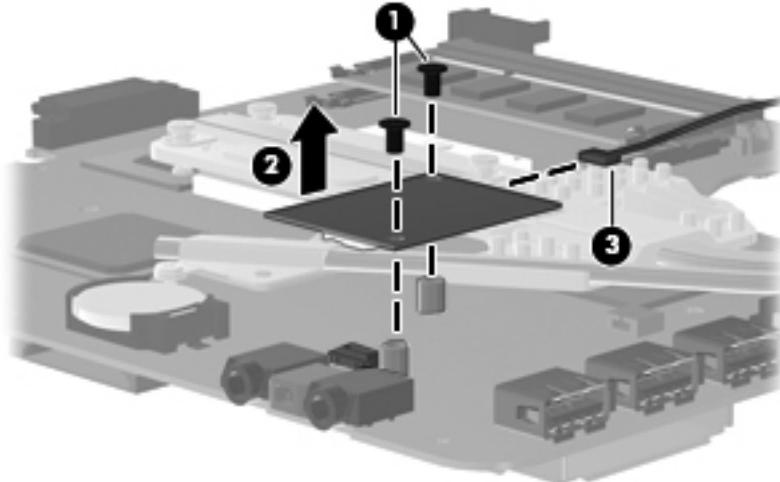
Description	Spare part number
For use in all countries and regions except Australia and New Zealand	510100-001
For use only in Australia and New Zealand	510100-011

Before removing the modem module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Remove the following components:
  - a. Hard drive (see “[Hard drive](#)” on page 4-8)
  - b. Optical drive (see “[Optical drive](#)” on page 4-18)
  - c. Keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20)
  - d. Speaker (see “[Speaker](#)” on page 4-24)
  - e. Display assembly (see “[Display assembly](#)” on page 4-25)
  - f. Top cover (see “[Top cover](#)” on page 4-32)
  - g. System board (see “[System board and optical drive connector board](#)” on page 4-35)

Remove the modem module:

1. Turn the system board upside down with the front toward you.
2. Remove the two Phillips PM2.5×4.0 screws **1** that secure the modem module to the system board.
3. Disconnect the modem module **2** from the system board.
4. Disconnect the modem module cable **3** from the modem module.



5. Remove the fingerprint reader board.

Reverse this procedure to install the modem module.

## Heat sink



The heat sink spare part kit includes replacement thermal material.

Description	Spare part number
For use only on computer models equipped with an AMD processor:	
■ For use only on computer models equipped with a graphics subsystem with discrete memory	538459-001
■ For use only on computer models equipped with a graphics subsystem with UMA memory	538456-001
For use only on computer models equipped with an Intel processor:	
■ For use only on computer models equipped with a graphics subsystem with discrete memory	538458-001
■ For use only on computer models equipped with a graphics subsystem with UMA memory	538457-001

Before removing the heat sink, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Remove the following components:
  - a. Hard drive (see “[Hard drive](#)” on page 4-8)
  - b. Optical drive (see “[Optical drive](#)” on page 4-18)
  - c. Keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20)
  - d. Speaker (see “[Speaker](#)” on page 4-24)
  - e. Display assembly (see “[Display assembly](#)” on page 4-25)
  - f. Top cover (see “[Top cover](#)” on page 4-32)
  - g. System board (see “[System board and optical drive connector board](#)” on page 4-35)

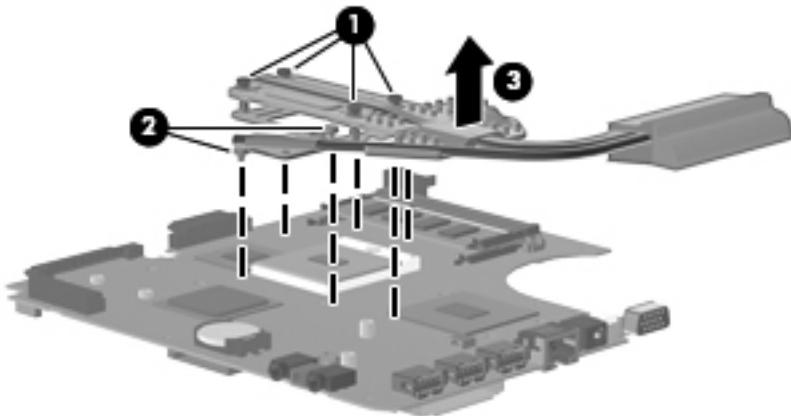
Remove the heat sink:

1. Turn the system board upside down with the front toward you.

 Steps 2 and 3 apply to computer models equipped with graphics subsystems with discrete memory. See steps 4 and 5 for instructions on removing the heat sink on computer models equipped with graphics subsystems with UMA memory.

2. Loosen the four Phillips PM2.5×9.0 captive screws **1** and the two Phillips PM2.0×5.0 captive screws **2** that secure the heat sink to the system board.
3. Remove the heat sink **3**.

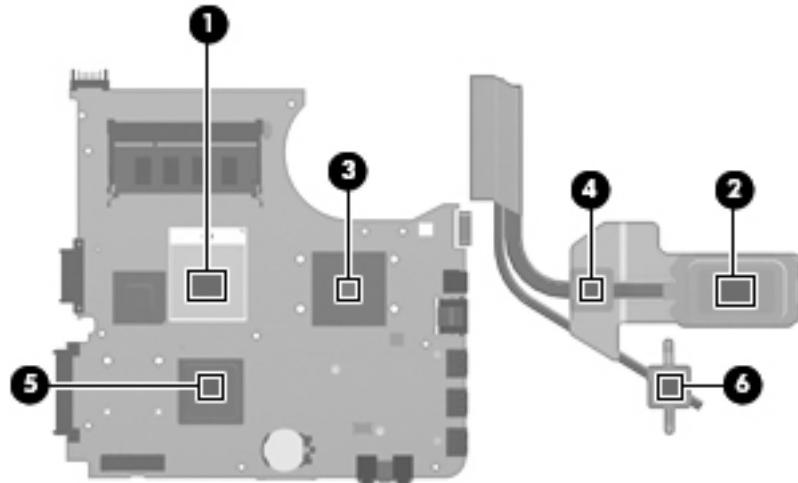
 Due to the adhesive quality of the thermal material located between the heat sink and system board components, it may be necessary to move the heat sink from side to side to detach the heat sink.



 The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board each time the heat sink is removed:

- Thermal paste is used on the processor **1** and the heat sink section **2** that services it.
- Thermal pads are used on the Northbridge chip **3** and the heat sink section **4** that services it.
- Thermal pads are used on the graphics subsystem memory module **5** and the heat sink section **6** that services it.

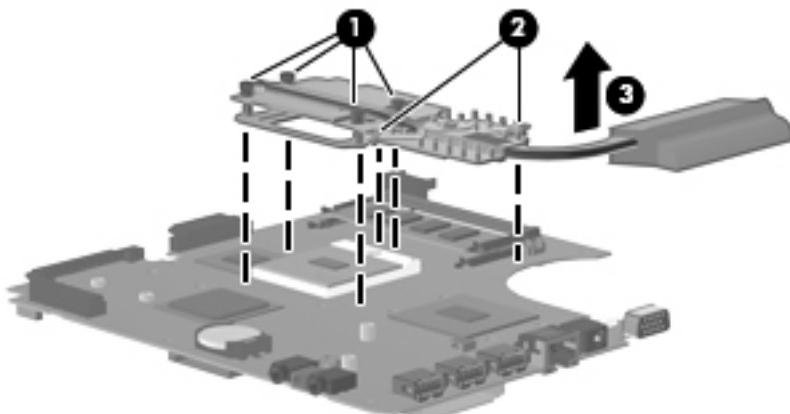
Replacement thermal material is included with all system board, heat sink, and processor spare part kits.



 Steps 4 and 5 apply to computer models equipped with graphics subsystems with UMA memory. See steps 2 and 3 for instructions on removing the heat sink on computer models equipped with graphics subsystems with discrete memory.

4. Loosen the four Phillips PM2.5×9.0 captive screws **1** and the two Phillips PM2.0×5.0 captive screws **2** that secure the heat sink to the system board.
5. Remove the heat sink **3**.

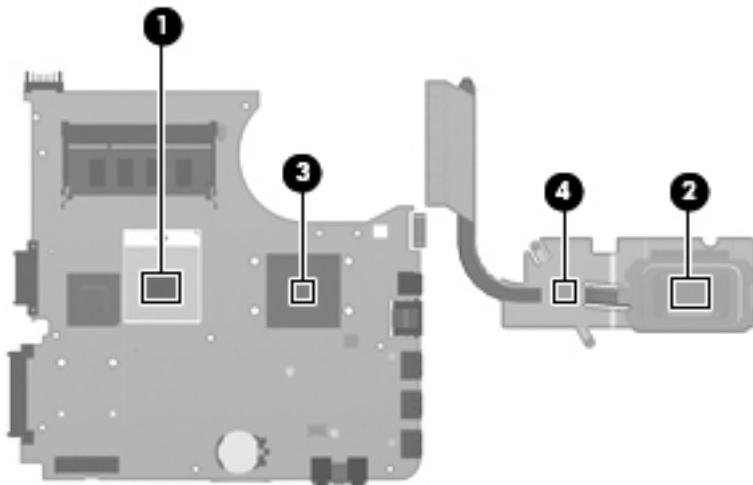
 Due to the adhesive quality of the thermal material located between the heat sink and system board components, it may be necessary to move the heat sink from side to side to detach the heat sink.



 The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board each time the heat sink is removed:

- Thermal paste is used on the processor **1** and the heat sink section **2** that services it.
- Thermal pads are used on the Northbridge chip **3** and the heat sink section **4** that services it.

Replacement thermal material is included with all system board, heat sink, and processor spare part kits.



Reverse this procedure to install the heat sink.

## Modem module cable



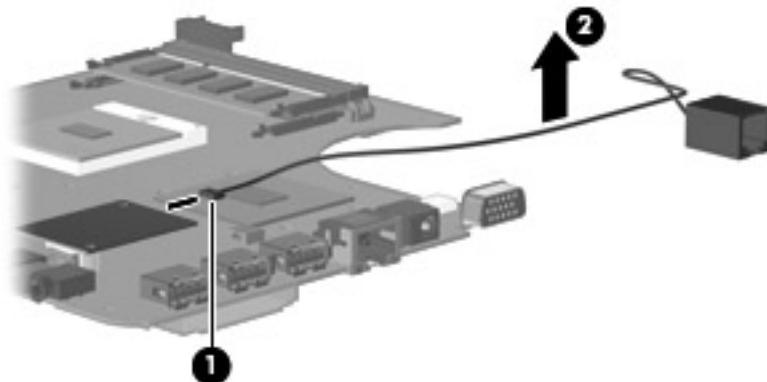
The modem module cable is included in the Cable Kit, spare part number 538465-001.

Before removing the modem module cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Remove the following components:
  - a. Hard drive (see “[Hard drive](#)” on page 4-8)
  - b. Optical drive (see “[Optical drive](#)” on page 4-18)
  - c. Keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20)
  - d. Speaker (see “[Speaker](#)” on page 4-24)
  - e. Display assembly (see “[Display assembly](#)” on page 4-25)
  - f. Top cover (see “[Top cover](#)” on page 4-32)
  - g. System board (see “[System board and optical drive connector board](#)” on page 4-35)
  - h. Heat sink (see “[Heat sink](#)” on page 4-44)

Remove the modem module cable:

1. Disconnect the modem module cable ① from the modem module.
2. Remove the modem module cable ②.



Reverse this procedure to install the modem module cable.

## Processor



The processor spare part kit includes replacement thermal material.

Description	Spare part number
AMD Turion RM-74 2.20-GHz processor (1-MB L2 cache)	507979-001
AMD Turion RM-72 2.10-GHz processor (1-MB L2 cache)	507978-001
AMD Athlon QL-64 2.10-GHz processor (1-MB L2 cache)	506053-001
AMD Athlon QL-62 2.00-GHz processor (1-MB L2 cache)	506053-001
AMD Sempron SI-42 2.10-GHz processor (512-KB L2 cache)	508102-001
Intel Core2 Duo processors:	
■ T5870 2.00-GHz processor (2-MB L2 cache, 800-MHz FSB)	535835-001
■ T1500 1.86-GHz processor (1-MB L2 cache, 800-MHz FSB)	576209-001
Intel Celeron processors:	
■ 560 2.13-GHz processor (1-MB L2 cache, 533-MHz FSB)	576208-001
■ 550 2.00-GHz processor (1-MB L2 cache, 533-MHz FSB)	576207-001

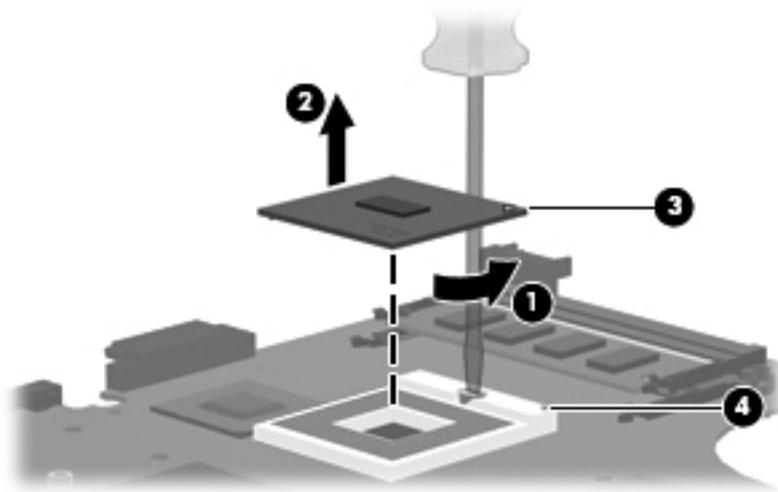
Before removing the processor, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).
5. Remove the following components:
  - a. Hard drive (see “[Hard drive](#)” on page 4-8)
  - b. Optical drive (see “[Optical drive](#)” on page 4-18)
  - c. Keyboard and switch cover (see “[Keyboard and switch cover](#)” on page 4-20)
  - d. Speaker (see “[Speaker](#)” on page 4-24)
  - e. Display assembly (see “[Display assembly](#)” on page 4-25)
  - f. Top cover (see “[Top cover](#)” on page 4-32)
  - g. System board (see “[System board and optical drive connector board](#)” on page 4-35)
  - h. Heat sink (see “[Heat sink](#)” on page 4-44)

Remove the processor:

1. Use a flat-bladed screwdriver to turn the processor locking screw **1** one-half turn counterclockwise until you hear a click.
2. Lift the processor **2** straight up and remove it.

 When you install the processor, the gold triangle **3** on the processor must be aligned with the triangle **4** embossed on the processor socket.



Reverse this procedure to install the processor.

# Computer Setup

## Computer Setup for computer models equipped with an AMD processor

### Starting Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load.



Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.

### Using Computer Setup

#### Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Diagnostics, and System Configuration menus.

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
3. To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
4. To close open dialog boxes and return to the main Computer Setup screen, press **esc**, and then follow the on-screen instructions.



You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

2. Press **f10** to enter BIOS Setup.
3. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the tab key and the arrow keys to select **File > Ignore changes and exit**, and then press **enter**.

- To save your changes and exit Computer Setup menus, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the tab key and the arrow keys to select **File > Save changes and exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

## Restoring factory settings in Computer Setup

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Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.
3. Use a pointing device or the arrow keys to select **File > Restore defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit:

Click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **File > Save changes and exit**, and then press **enter**.

Your changes go into effect when the computer restarts.



Your password settings and security settings are not changed when you restore the factory settings.

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## Computer Setup menus

The menu tables in this section provide an overview of Computer Setup options.



Some of the Computer Setup menu items listed in this chapter may not be supported by your computer.

### File Menu

Select	To do this
System Information	<ul style="list-style-type: none"><li>■ View identification information for the computer and the batteries in the system.</li><li>■ View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.</li></ul>
Set System Date and Time	Set or change the date and time on the computer.
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Hard drive mode, password settings, and security settings are not changed when you restore the factory settings.)
Ignore changes and exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

## Security Menu



Some of the menu items listed in this section may not be supported by your computer.

Select	To do this
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management (requires a BIOS administrator password)	<ul style="list-style-type: none"> <li>■ Create a new BIOS user account.</li> <li>■ View a list of ProtectTools users.</li> </ul>
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (disabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (disabled by default).
Allow Reset of HP ProtectTools security keys	Enable/disable reset of HP ProtectTools security keys.
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
DriveLock Passwords	<ul style="list-style-type: none"> <li>■ Enable/disable DriveLock on any computer hard drive (enabled by default).</li> <li>■ Change a DriveLock user password or master password.</li> </ul> <p> DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.</p>
Automatic DriveLock	Enable/disable Automatic DriveLock support.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive or the drive in the upgrade bay.
	<p> If you run Disk Sanitizer, the data on the selected drive is destroyed permanently.</p>
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

## Diagnostics Menu

Select	To do this
System Diagnostics Menu	<ul style="list-style-type: none"> <li>■ System Information—Displays the following information:           <ul style="list-style-type: none"> <li><input type="checkbox"/> Identification information for the computer and the batteries in the system.</li> <li><input type="checkbox"/> Specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.</li> </ul> </li> <li>■ Start-up Test—Verifies the system components needed for starting the computer.</li> <li>■ Run-In Test—Runs a comprehensive check on system memory.</li> <li>■ Hard Disk Test—Runs a comprehensive self-test on any hard drive in the system.</li> <li>■ Error Log—Displays a log file if any errors have occurred.</li> </ul>

## System Configuration Menu



Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language	Change the Computer Setup language.
Boot Options	<ul style="list-style-type: none"> <li>■ Set a Startup Menu delay (in seconds).</li> <li>■ Enable/disable Custom Logo (disabled by default).</li> <li>■ Enable/disable Display Diagnostic URL (enabled by default).</li> <li>■ Enable/disable CD-ROM boot (enabled by default).</li> <li>■ Enable/disable SD Card boot (enabled by default).</li> <li>■ Enable/disable floppy boot (enabled by default).</li> <li>■ Enable/disable PXE Internal NIC boot (disabled by default).</li> <li>■ Set the Express Boot Popup delay in seconds.</li> <li>■ Set the boot order.</li> </ul>
Device Configurations	<ul style="list-style-type: none"> <li>■ Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following:           <ul style="list-style-type: none"> <li><input type="checkbox"/> Use of a USB keyboard in Computer Setup even when a Windows operating system is not running.</li> <li><input type="checkbox"/> Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer.</li> </ul> </li> <li>■ Enable/disable fan always on while connected to an AC outlet (disabled by default).</li> <li>■ SATA (Serial Advanced Technology Attachment) device mode. The following options are available:           <ul style="list-style-type: none"> <li><input type="checkbox"/> AHCI (Advanced Host Controller Interface)</li> <li><input type="checkbox"/> IDE (Integrated Drive Electronics)</li> </ul> </li> <li> Availability of the options above varies by computer model.</li> <li>■ Enable/Disable Unified Extensible Firmware Interface (UEFI) mode (disabled by default).</li> </ul>

(Continued)

Select	To do this
<b>System Configuration menu (continued)</b>	
Built-In Device Options	<ul style="list-style-type: none"><li>■ Enable/disable the wireless button state (enabled by default).</li><li>■ Enable/disable embedded Bluetooth device radio (enabled by default).</li><li>■ Enable/disable the Network Interface Controller (LAN) (enabled by default).</li><li>■ Set the wake on LAN state. Options include the following:<ul style="list-style-type: none"><li><input type="checkbox"/> Disabled</li><li><input type="checkbox"/> Boot to Network (set by default)</li><li><input type="checkbox"/> Follow Boot Order</li></ul></li><li>■ Enable/disable the optical disc drive (enabled by default).</li><li>■ Enable/disable the microphone.</li><li>■ Enable/disable a modem device (enabled by default).</li><li>■ Enable/disable the embedded WLAN device (enabled by default).</li><li>■ Enable/disable LAN/WLAN switching (disabled by default).</li><li>■ Enable/disable the integrated camera (select models only; enabled by default).</li></ul>
Port Options (all are enabled by default)	<p> All port options are enabled by default.</p> <ul style="list-style-type: none"><li>■ Enable/disable the ExpressCard slot.</li><li>■ Enable/disable the flash media reader.</li><li>■ Enable/disable the USB port.</li></ul> <p> Disabling the USB port also disables MultiBay devices and ExpressCard devices on the advanced port replicator.</p>
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

# Computer Setup for computer models equipped with an Intel processor

## Starting Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load.



Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

Pointing devices are not supported in Computer Setup. You must use the keyboard to navigate and make selections. An external keyboard connected by USB can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer.
2. Before Windows opens and while the “F10=ROM Based Setup” message is displayed in the lower-left corner of the screen, press **f10**.

## Using Computer Setup

### Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Diagnostics, and System Configuration menus.

1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.

Because Computer Setup is not Windows-based, it does not support the TouchPad. Navigation and selection are by keystroke:

- To choose a menu or a menu item, use the arrow keys.
  - To select an item, press **enter**.
  - To close open dialog boxes and return to the main Computer Setup screen, press **esc**.
  - To view navigation information, press **f1**.
  - To change the language, press **f2**.
2. Select the **File**, **Security**, **Diagnostics** or **System Configuration** menu.
  3. To exit Computer Setup, choose one of the following methods:
    - To exit Computer Setup without saving your preferences, use the arrow keys to select **File > Ignore changes and exit**. Then follow the instructions on the screen.
    - To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

## Restoring factory settings in Computer Setup

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **File > Restore defaults** and then press **enter**.
3. When the confirmation dialog box opens, press **f10**.
4. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.



Your password settings and security settings are not changed when you restore the factory settings.

## Computer Setup menus

The menu tables in this section provide an overview of Computer Setup options.



Some of the Computer Setup menu items listed in this chapter may not be supported by your computer.

### File Menu

Select	To do this
System information	<ul style="list-style-type: none"><li>■ View identification information for the computer and the batteries in the system.</li><li>■ View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.</li></ul>
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Password settings and security settings are not changed when you restore the factory settings.)
Ignore changes and exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

## Security Menu



Some of the menu items listed in this section may not be supported by your computer.

Select	To do this
Setup Password	Enter, change, or delete a setup password.
Power-On Password	Enter, change, or delete a power-on password.
Password Options	<ul style="list-style-type: none"> <li>■ Enable/disable stringent security.</li> <li>■ Enable/disable the password requirement on computer restart.</li> </ul>
DriveLock Passwords	<ul style="list-style-type: none"> <li>■ Enable/disable DriveLock on any computer hard drive.</li> <li>■ Change a DriveLock user password or master password.</li> </ul> <p> DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.</p>
System IDs	Enter a user-defined computer asset tracking number and ownership tag.
Disk Sanitizer	<p>Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available:</p> <ul style="list-style-type: none"> <li>■ Fast: Runs the Disk Sanitizer erase cycle once.</li> <li>■ Optimum: Runs the Disk Sanitizer erase cycle 3 times.</li> <li>■ Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list.</li> <li>■ Last status: Provides information about the last time Disk Sanitizer ran on the computer.</li> </ul> <p> If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.</p>

## Diagnostics Menu

Select	To do this
HDD Self-Test Options	Run a comprehensive self-test on any hard drive in the system.
Memory Check	Run a comprehensive test on system memory.
Startup check	Verify the system components needed for starting the computer.

## System Configuration Menu



Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language (or press <b>f2</b> )	Change the Computer Setup language.
Boot Options	<ul style="list-style-type: none"> <li>■ Set an <b>f9</b>, <b>f10</b>, and <b>f12</b> delay when starting up.</li> <li>■ Enable/disable CD-ROM boot.</li> <li>■ Enable/disable floppy boot.</li> <li>■ Enable/disable internal network adapter boot and set the boot mode (PXE).</li> <li>■ Enable/disable MultiBoot, which sets a boot order that can include most boot devices in the system.</li> <li>■ Set the Express Boot Popup delay in seconds.</li> <li>■ Set the boot order.</li> </ul>
Device Configurations	<ul style="list-style-type: none"> <li>■ Swap the functions of the <b>fn</b> key and left <b>ctrl</b> key.</li> <li>■ Enable/disable USB legacy support. When enabled, USB legacy support allows the following: <ul style="list-style-type: none"> <li><input type="checkbox"/> Use of a USB keyboard in Computer Setup even when a Windows operating system is not running.</li> <li><input type="checkbox"/> Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer.</li> </ul> </li> <li>■ Enable/disable BIOS DMA data transfers.</li> <li>■ Enable/disable fan always on while connected to an AC outlet.</li> <li>■ Enable/disable Data Execution Prevention. When enabled, the processor can disable some virus code execution, which helps to improve computer security.</li> <li>■ Enable/disable SATA Native Mode.</li> <li>■ Enable/disable Dual Core CPU.</li> <li>■ Choose Bit-shift or LBA-assisted HDD Translation Mode.</li> <li>■ Enable/disable Virtualization Technology.</li> </ul>
Built-In Device Options	<ul style="list-style-type: none"> <li>■ Enable/disable embedded WLAN Device Radio.</li> <li>■ Enable/disable Wake on LAN.</li> <li>■ Enable/disable the optical disc drive.</li> </ul>
Port Options	<ul style="list-style-type: none"> <li>■ Enable/disable the USB port.</li> <li>■ Enable/disable the ExpressCard slot.</li> </ul>

## Specifications

### Computer specifications

	Metric	U.S.
<b>Dimensions</b>		
Length	25.43 cm	10.01 in
Width	37.18 cm	14.64 in
Height	3.20 cm	1.26 in
<b>Weight</b>	2.49 kg	5.5 lbs
<b>Input power</b>		
Operating voltage	19.0 V dc @ 4.74 A - 65 W	
Operating current	4.74 A	
<b>Temperature</b>		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
<b>Relative humidity</b>		
Operating	10% to 90%	
Nonoperating	5% to 95%	
<b>Maximum altitude</b> (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
 Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.		

## 15.6-in display specifications

	Metric	U.S.
<b>Dimensions</b>		
Height	21.1 cm	8.3 in
Width	33.5 cm	13.2 in
Diagonal	39.6 cm	15.6 in
<b>Number of colors</b>		
	Up to 16.8 million	
<b>Contrast ratio</b>		
	250:1 (typical)	
<b>Brightness</b>		
	200 nits (typical)	
<b>Pixel resolution</b>		
Pitch	0.279 × 0.279 mm	
Format	1366 × 768	
Configuration	RGB vertical stripe	
<b>Backlight</b>		
	LED	
<b>Character display</b>		
	80 × 25	
<b>Total power consumption</b>		
	4.0 W	
<b>Viewing angle</b>		
	±40° horizontal, +120°/-40° vertical (typical)	

## Hard drive specifications

	500-GB*	320-GB*	250-GB*	160-GB*
<b>Dimensions</b>				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g	101 g
<b>Interface type</b>				
<b>Transfer rate</b>	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
<b>Security</b>				
<b>Seek times</b> (typical read, including setting)				
Single track	1.0 ms	1.5 ms	2.0 ms	2.0 ms
Average	14.0 ms	12.0 ms	12.0 ms	12.0 ms
Maximum	22.0 ms	22.0 ms	22.0 ms	22.0 ms
<b>Logical blocks</b>				
<b>Disc rotational speed</b>	5400 rpm	5400rpm	7200 and 5400 rpm	7200 and 5400 rpm
<b>Operating temperature</b>		5°C to 55°C (41°F to 131°F)		

\*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.



Certain restrictions and exclusions apply. Contact technical support for details.

# DVD±RW and CD-RW SuperMulti Double-Layer Drive specifications

Applicable disc	Read:	Write:
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, and DVD-RAM	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, and DVD-RAM
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Cache buffer	2.5 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8x DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
Transfer mode	Multiword DMA mode	

## DVD-ROM Drive specifications

Applicable disc	Read:	Write:
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CDEXTRA, Portfolio, CD-R, CD-RW), CDR, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	CD-R and CD-RW
Access time	CD	DVD
Random	< 110 ms	< 130 ms
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
24X CD-RW	3,600 KB/sec	

## System DMA specifications

Hardware	DMA System function
DMA0	Not applicable
DMA1*	Not applicable
DMA2*	Not applicable
DMA3	Not applicable
DMA4	Direct memory access controller
DMA5*	Not applicable
DMA6	Not assigned
DMA7	Not assigned

\*ExpressCard controller can use DMA 1, 2, or 5.

## System memory map specifications

Size	Memory address	System function
640 KB	0000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
64 KB	000C0000-000CFFFF	Video BIOS
64 KB	000E8000-000FFFFFF	System BIOS
	00100000-XFFFFFFF	Extended memory (based on memory installed)
	(X+1)0000000-FEDFFFFF	PCI bus
	FED00000-FED003FF	High precision event timer
	FEE01000-FFFFFFFFF	PCI bus

## System interrupt specifications

Hardware IRQ	System function
IRQ0	System timer
IRQ1	Standard 101-/102-key or Microsoft natural keyboard
IRQ8	System CMOS/real-time clock
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ16	Intel ICH9 family USB universal host controller 2937 Mobile Intel 4 Series express chipset family
IRQ17*	High definition audio controller Intel ICH9 family USB universal host controller 2938 Marvell Yukon 88E8072 PCIE-gigabit Ethernet controller
IRQ18	Intel ICH9 family USB universal host controller 2939 Intel ICH9 family USB universal host controller 2936
IRQ19	Intel ICH9 family USB2 enhanced controller 293C
IRQ20	Intel ICH9 family USB2 enhanced controller 293A Intel ICH9 family USB universal host controller 2934
IRQ21	Intel ICH9M-E/M SATA AHCI controller
IRQ22	Intel ICH9 family USB universal host controller 2935

\*Default configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.

 PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.

 For operating systems after Windows 2000, APIC (Advanced programming interrupt controller) is used.

# System I/O address specifications

I/O address (hex)	System function (shipping configuration)
000 - 01F	DMA controller
020 - 021	Program interrupt controller
024 - 025	Program interrupt controller
028 - 029	Program interrupt controller
02C - 03D	Program interrupt controller
02E - 02F	Motherboard resources
030 - 031	Program interrupt controller
034 - 035	Program interrupt controller
038 - 039	Program interrupt controller
03C- 03D	Program interrupt controller
040 - 043	System timer
04E-04F	Motherboard resources
050-053	System timer
060	Standard 101-/102-key or Microsoft natural keyboard
061	Motherboard resources
062	Microsoft ACPI-compliant embedded controller
063	Motherboard resources
064	Standard 101-/102-key or Microsoft natural keyboard
065	Motherboard resources
066	Microsoft ACPI-compliant embedded controller
067	Motherboard resources
070	Motherboard resources
071-077	System CMOS/real time clock
080	Motherboard resources
081-091	Direct memory access controller
092	Motherboard resources
093-09F	Direct memory access controller
0A0-0A1	Program interrupt controller
0A4-0A5	Program interrupt controller
0A8-0A9	Program interrupt controller
0AC-0AD	Program interrupt controller
0B0-0B1	Program interrupt controller
0B2-0B3	Motherboard resources
0B4- 0B5	Program interrupt controller
0B8-0B9	Program interrupt controller
0BC- 0BD	Program interrupt controller

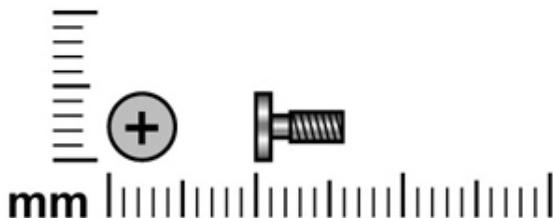
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<b>I/O address (hex)</b>	<b>System function (shipping configuration)</b>
0C0- 0DF	Direct memory access controller
0F0- 0F0	Numeric data processor
0200-027F	Motherboard resources
3B0-3BB	Mobile Intel 4 series express chipset family
3C0-3DF	Mobile Intel 4 series express chipset family
400-47F	Motherboard resources
4D0-4D1	Programmable interrupt controller
500-57F	Motherboard resources
1000-1003	Motherboard resources
1010-101F	Motherboard resources
2000-20FF	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet controller
2000-2FFF	ICH9 family PCI express root port6-294A
3000-4FFF	ICH9 family PCI express root port5-2948
5000-6FFF	ICH9 family PCI express root port3-2944
7000-701F	ICH9M-E/M SATA AHCI controller
7020-703F	ICH9 family USB universal host controller-2936
7040-705F	ICH9 family USB universal host controller-2935
7060-707F	ICH9 family USB universal host controller-2934
7080-709F	ICH9 family USB universal host controller-2939
70A0-70BF	ICH9 family USB universal host controller-2938
70C0-70DF	ICH9 family USB universal host controller-2937
70E0-70E7	ICH9M-E/M SATA AHCI controller
70E8-70EF	ICH9M-E/M SATA AHCI Controller
70F0-70F7	Mobile Intel 4 series express chipset family
70F8-70FB	ICH9M-E/M SATA AHCI controller
70FC-70FF	ICH9M-E/M SATA AHCI controller
EF80-EF9F	Motherboard resources
FE00-FE0F	Motherboard resources
FE80-EF8F	Motherboard resources
FFFF	Motherboard resources

## Screw listing

This section provides specification and reference information for the screws used in the computer. The screws listed in this section are available in the Screw Kit, spare part number 538449-001.

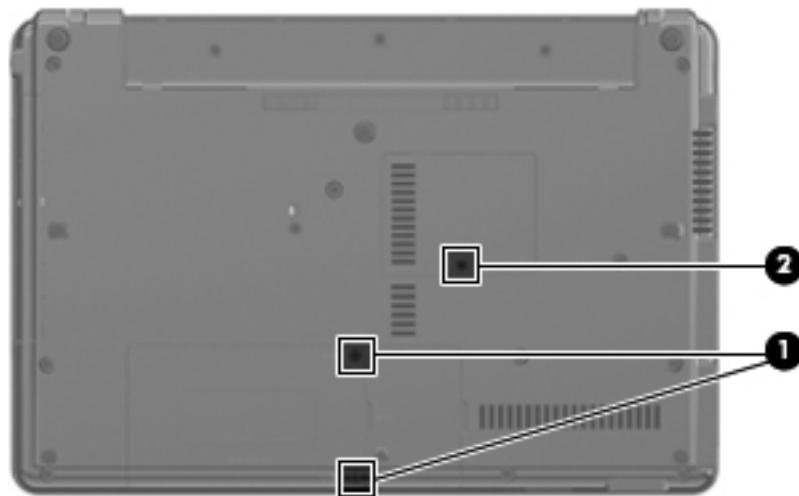
### Phillips PM2.0x6.0 captive screw



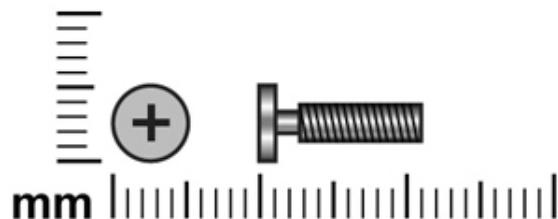
Color	Quantity	Length	Thread	Head diameter
Black	3	6.0 mm	2.0 mm	5.0 mm

#### Where used:

- ① Two captive screws that secure the hard drive cover to the computer (screws are secured on the hard drive cover by C-clips)
- ② One captive screw that secures the memory module compartment cover to the computer (screw is secured on the memory module compartment cover by a C-clip)

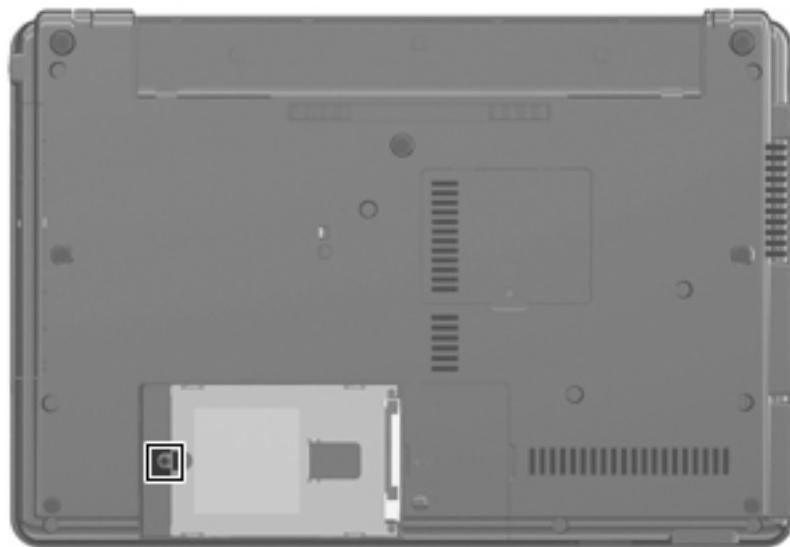


## Phillips PM2.5x11.0 captive screw

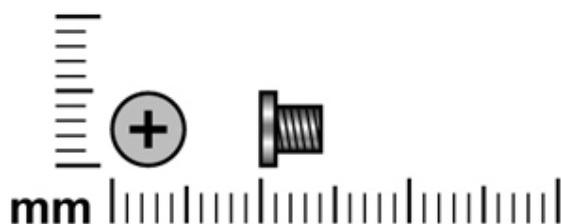


Color	Quantity	Length	Thread	Head diameter
Black	1	11.0 mm	2.5 mm	5.0 mm

**Where used:** One screw that secures the hard drive to the computer (screw is secured to the hard drive bracket)

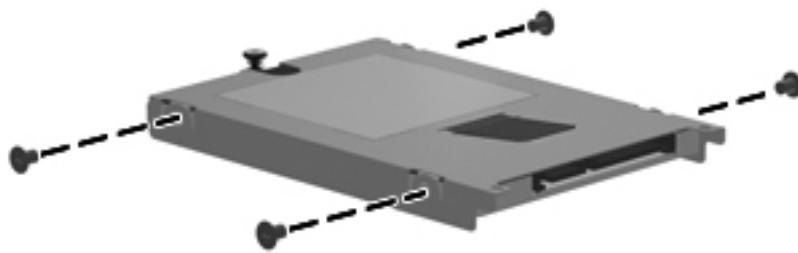


## Phillips PM3.0x4.0 screw

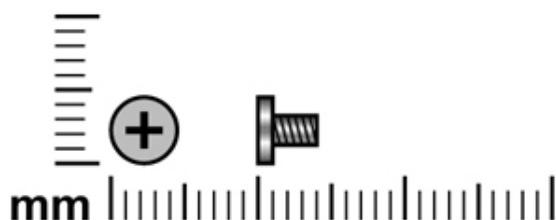


Color	Quantity	Length	Thread	Head diameter
Silver	4	4.0 mm	3.0 mm	5.0 mm

**Where used:** 4 screws that secure the hard drive bracket to the hard drive

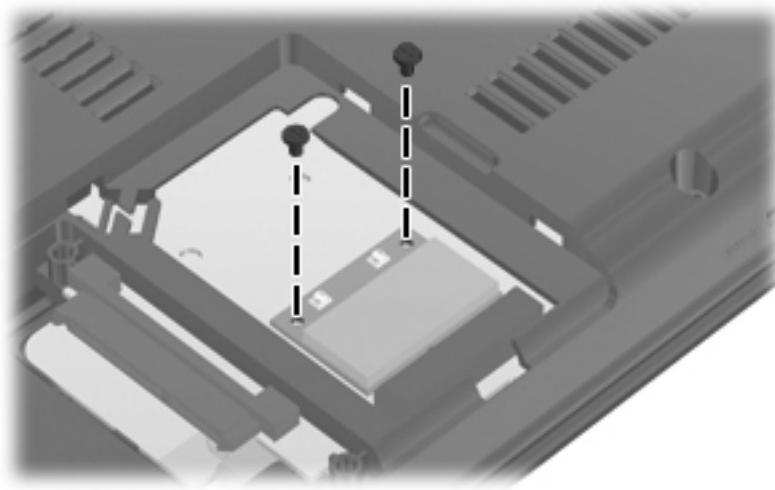


## Phillips PM2.5x4.0 screw

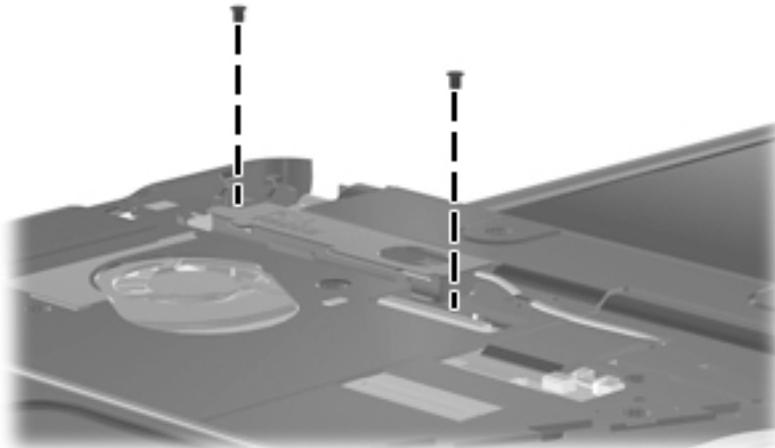


Color	Quantity	Length	Thread	Head diameter
Black	9	4.0 mm	2.5 mm	5.0 mm

**Where used:** 2 screws that secures the WLAN module to the computer

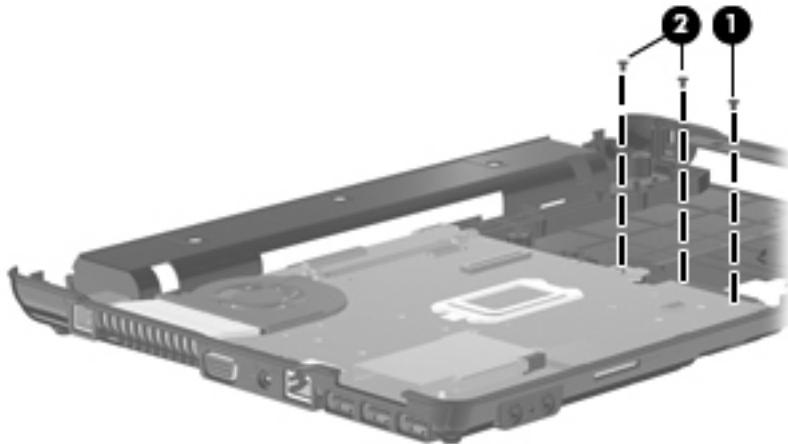
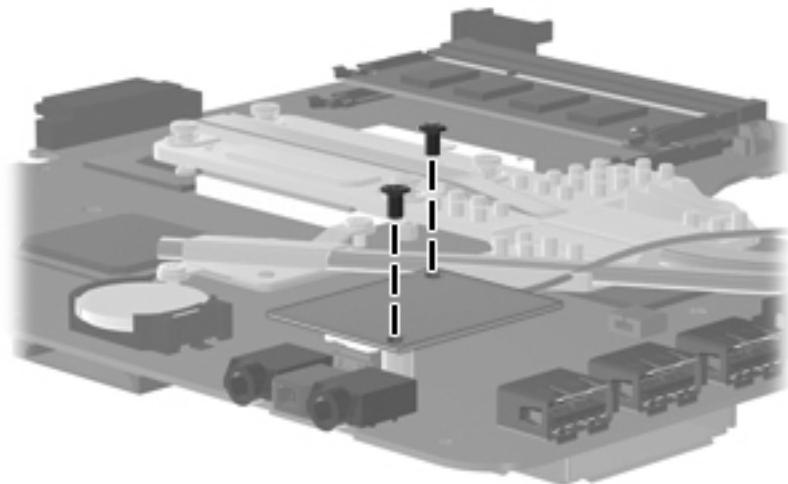


**Where used:** 2 screws that secure the speaker to the top cover

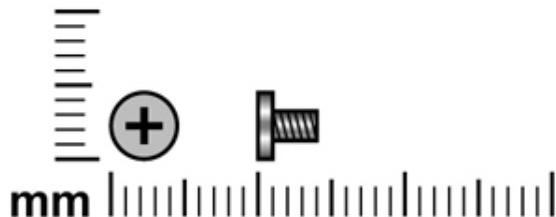


**Where used:**

- ① One screw that secures the system board to the base enclosure
- ② Two screws that secure the optical drive connector board to the base enclosure

**Where used:** 2 screws that secure the modem module to the system board

## Phillips PM2.5x4.0 screw

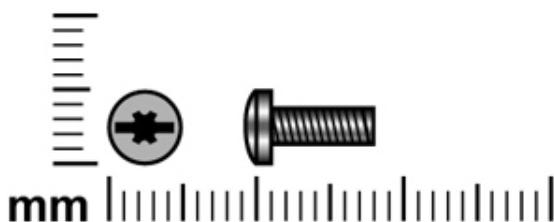


Color	Quantity	Length	Thread	Head diameter
Silver	2	4.0 mm	2.5 mm	5.0 mm

**Where used:** 2 screws that secure the wireless antenna transceivers to the display enclosure



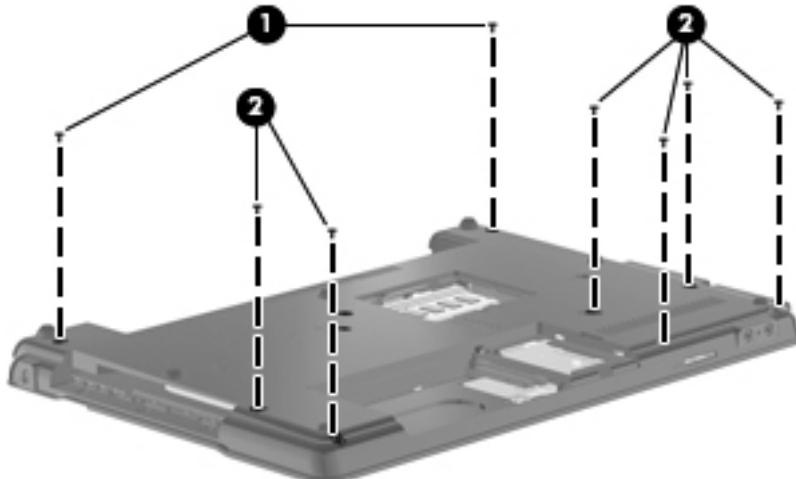
## Slotted Torx T8M2.5×8.0 screw



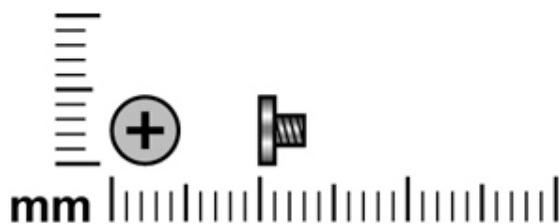
Color	Quantity	Length	Thread	Head diameter
Black	8	8.0 mm	2.5 mm	5.0 mm

### Where used:

- ① Two screws that secure the switch cover to the computer
- ② Six screws that secure the top cover to the computer

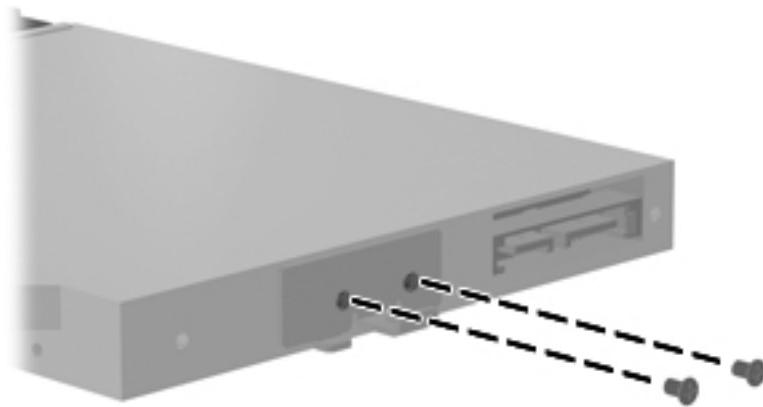


## Phillips PM2.0x3.0 screw

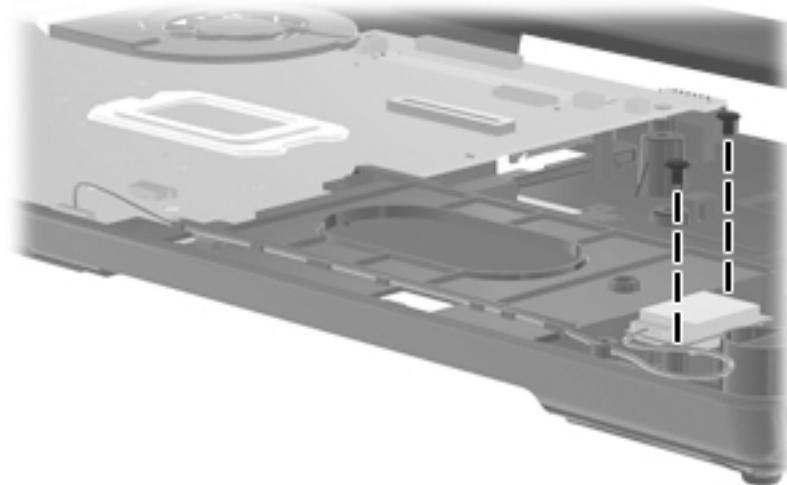


Color	Quantity	Length	Thread	Head diameter
Black or silver	4	3.0 mm	2.0 mm	4.5 mm

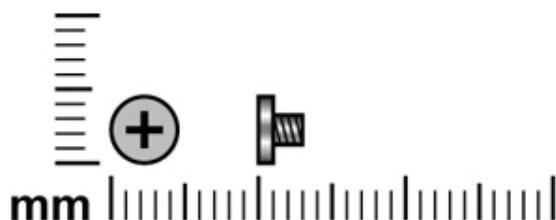
**Where used:** 2 screws that secure the optical drive bracket to the optical drive



**Where used:** 2 screws that secure the Bluetooth module to the base enclosure

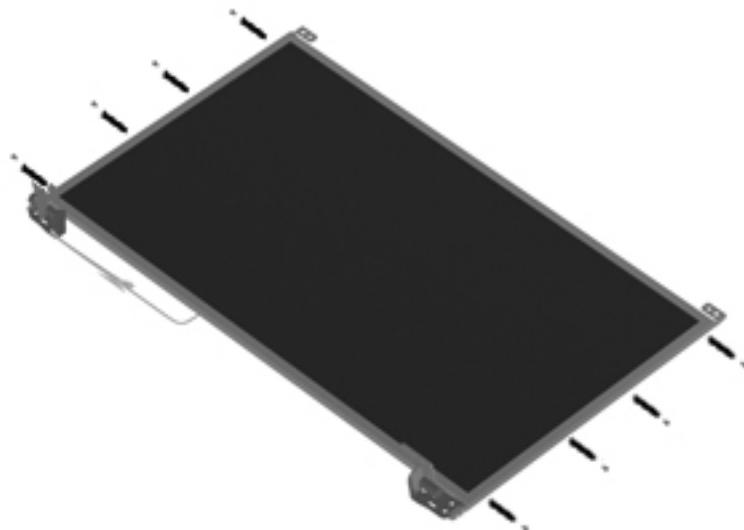


## Phillips PM2.0x3.0 screw

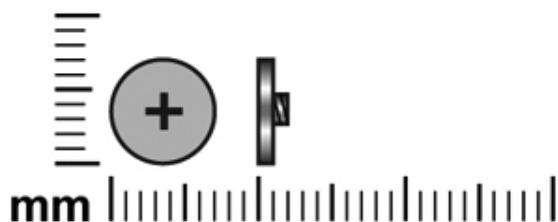


Color	Quantity	Length	Thread	Head diameter
Silver	8	3.0 mm	2.0 mm	4.5 mm

**Where used:** 8 screws that secure the display hinges to the display panel

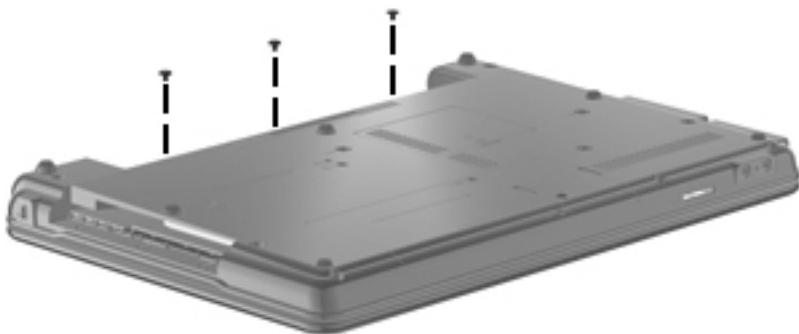


## Phillips PM2.0x2.0 broadhead screw

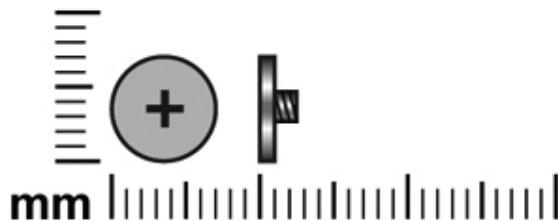


Color	Quantity	Length	Thread	Head diameter
Black	3	2.0 mm	2.0 mm	7.0 mm

**Where used:** 3 screws that secure the switch cover to the computer in the battery bay

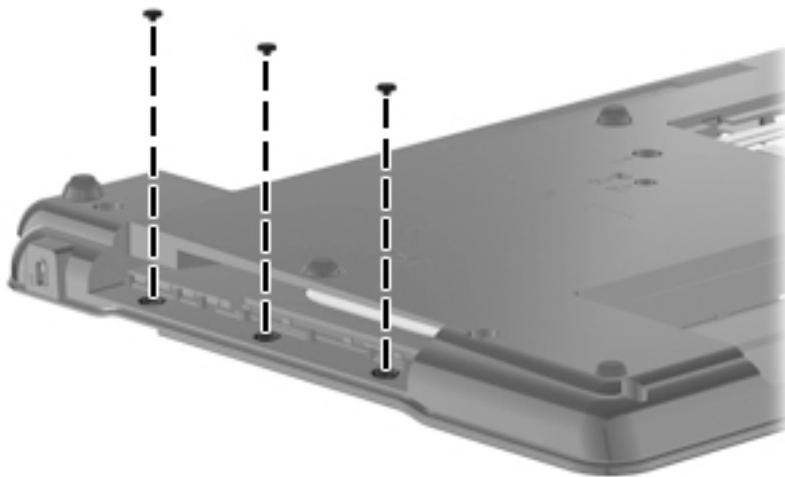


## Phillips PM2.0x3.0 broadhead screw

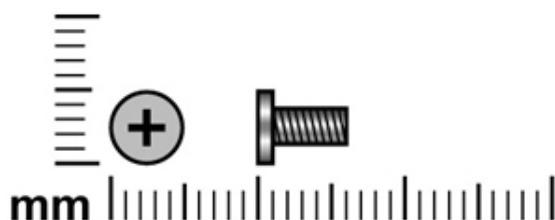


Color	Quantity	Length	Thread	Head diameter
Black	3	3.0 mm	2.0 mm	7.0 mm

**Where used:** 3 screws that secure the top cover to the computer in the optical drive bay



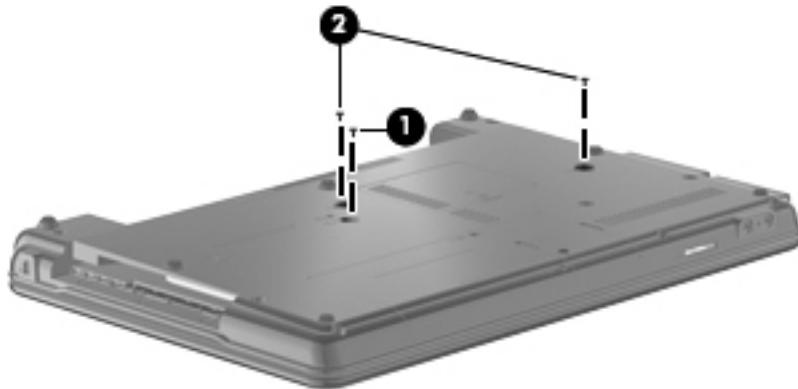
## Phillips PM2.5x8.0 screw



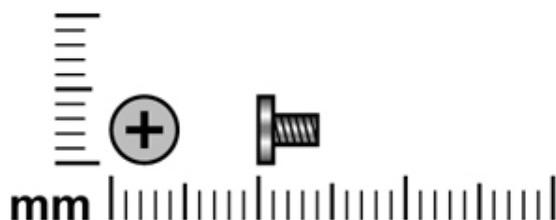
Color	Quantity	Length	Thread	Head diameter
Black	3	8.0 mm	2.5 mm	5.0 mm

**Where used:**

- ① One screw that secures the optical drive to the computer
- ② Two screws that secure the keyboard to the computer



## Phillips PM2.0x4.0 screw

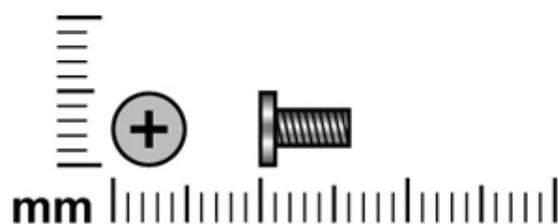


Color	Quantity	Length	Thread	Head diameter
Black	1	4.0 mm	2.0 mm	4.5 mm

**Where used:** One screw that secures the top cover to the base enclosure



## Phillips PM2.5x6.0 screw

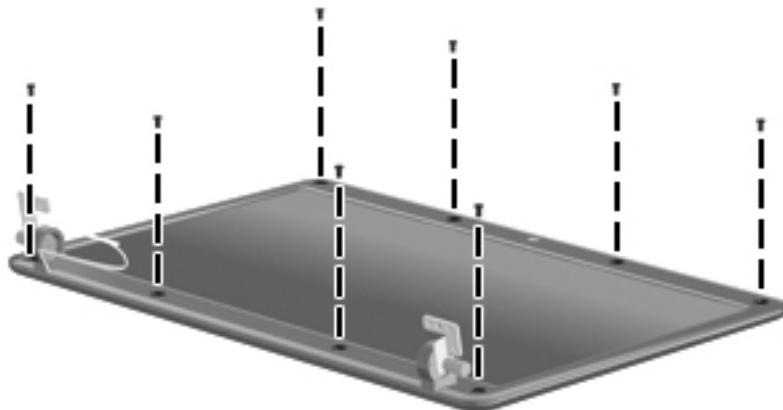


Color	Quantity	Length	Thread	Head diameter
Black	16	6.0 mm	2.5 mm	5.0 mm

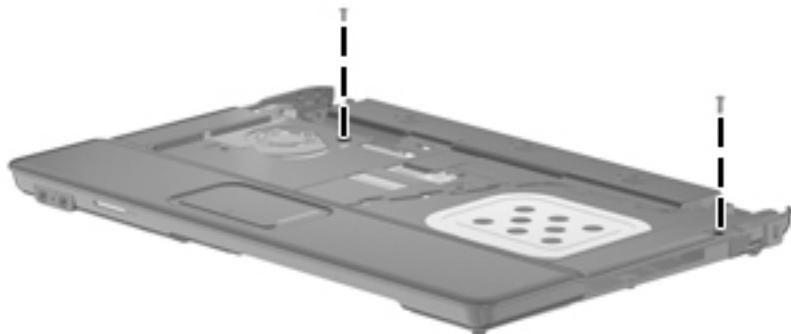
**Where used:** 4 screws that secure the display assembly to the computer



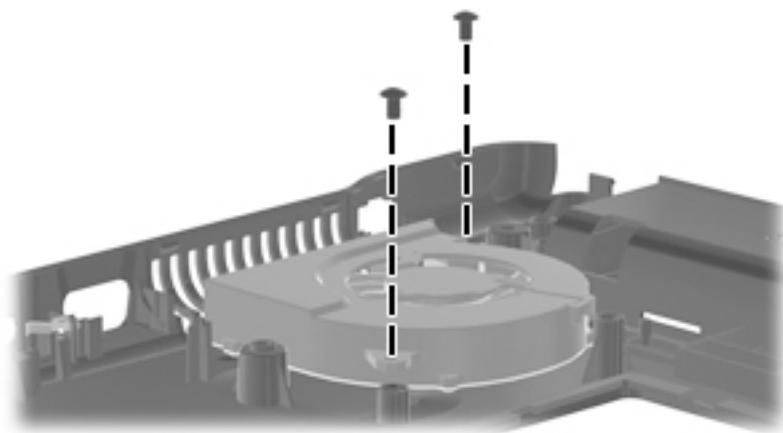
**Where used:** 8 screws that secure the display bezel to the display assembly



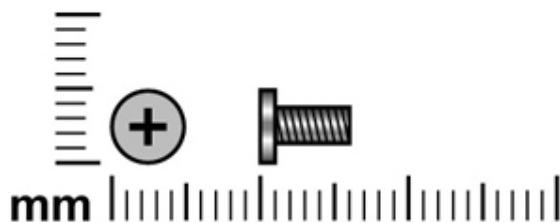
**Where used:** 2 screws that secure the top cover to the base enclosure



**Where used:** 2 screws that secure the fan to the base enclosure

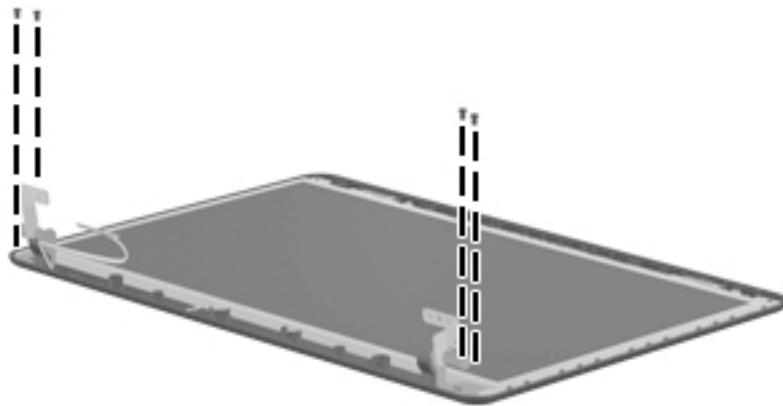


## Phillips PM2.5x5.0 screw

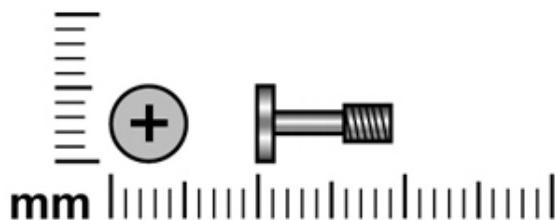


Color	Quantity	Length	Thread	Head diameter
Black	4	5.0 mm	2.5 mm	5.0 mm

**Where used:** 4 screws that secure the display panel to the display enclosure

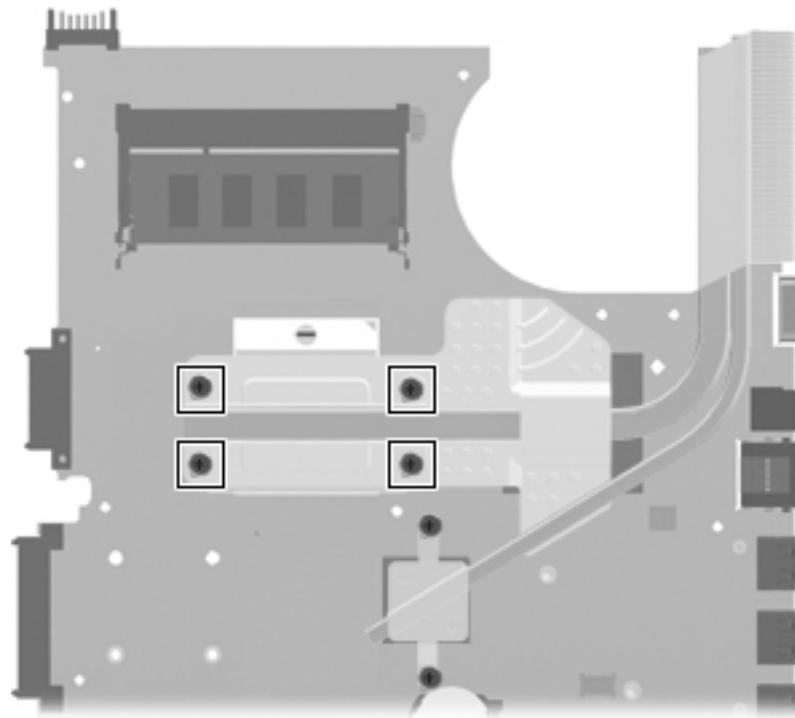


## Phillips PM2.5x9.0 captive screw

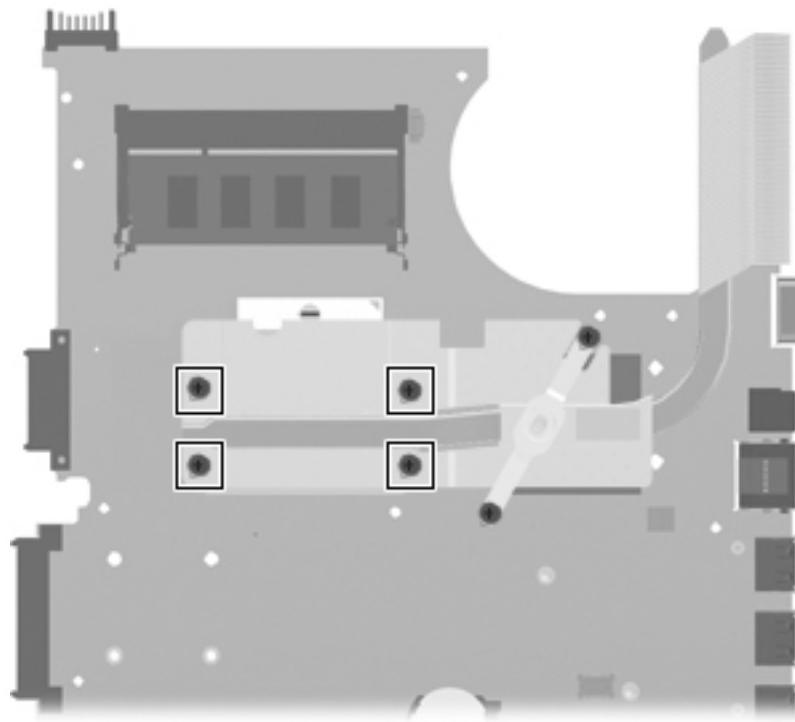


Color	Quantity	Length	Thread	Head diameter
Silver	4	9.0 mm	2.5 mm	5.0 mm

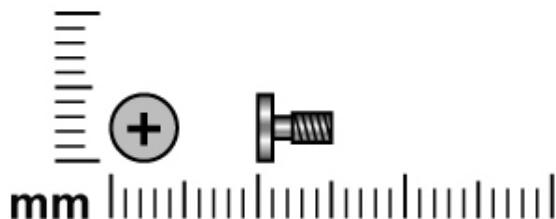
**Where used:** 4 captive screws that secure the heat sink to the system board on computer models with a graphics subsystem with discrete memory (screws are secured on the heat sink by C-clips)



**Where used:** 4 captive screws that secure the heat sink to the system board on computer models with a graphics subsystem with UMA memory (screws are secured on the heat sink by C-clips)

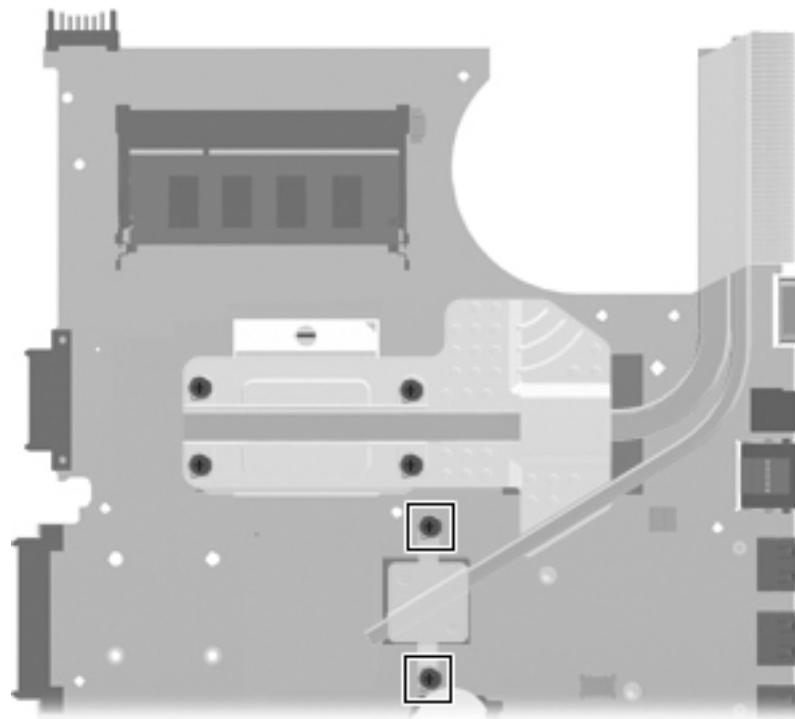


## Phillips PM2.0x5.0 captive screw

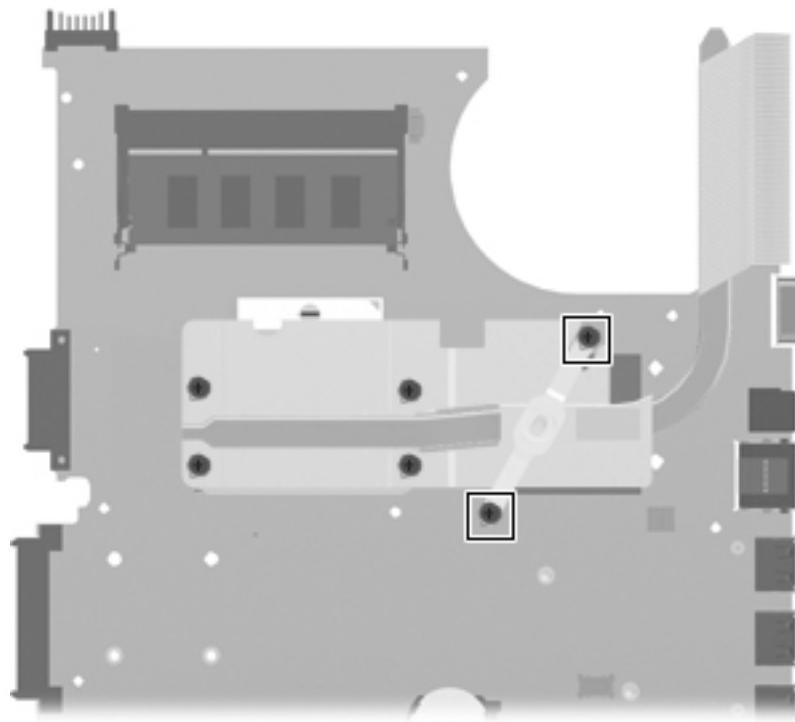


Color	Quantity	Length	Thread	Head diameter
Silver	2	5.0 mm	2.0 mm	5.0 mm

**Where used:** 2 captive screws that secure the heat sink to the system board on computer models with a graphics subsystem with discrete memory (screws are secured on the heat sink by C-clips)



**Where used:** 2 captive screws that secure the heat sink to the system board on computer models with a graphics subsystem with UMA memory (screws are secured on the heat sink by C-clips)



---

## Backup and recovery

### Backup and recovery in Windows Vista

#### Overview

To protect your information, use the Backup and Restore Center to back up individual files and folders, back up your entire hard drive (select models only), or create system restore points. In case of system failure, you can use the backup files to restore the contents of your computer.

The Backup and Restore Center provides the following options:

- Backing up individual files and folders
- Backing up the entire hard drive (select models only)
- Scheduling automatic backups (select models only)
- Creating system restore points
- Recovering individual files
- Restoring the computer to a previous state
- Recovering information using recovery tools



For detailed instructions, perform a search for these topics in Help and Support. In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

---

## Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

You can back up your information to an optional external hard drive, a network drive, or discs.

Note the following when backing up:

- Store personal files in the Documents folder, and back it up regularly.
- Back up templates that are stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

To create a screen shot:

1. Display the screen you want to save.

2. Copy the screen image:

To copy only the active window, press **alt+fn+prt sc.**

To copy the entire screen, press **fn+prt sc.**

3. Open a word-processing document, and then select **Edit > Paste**. The screen image is added to the document.

4. Save the document.

- When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD+R DL, DVD-R, DVD-R DL, or DVD-RW. The discs you use will depend on the type of optical drive installed in your computer.



DVDs and DVDs with double-layer (DL) support store more information than CDs, so using them for backup reduces the number of recovery discs required.

- When backing up to discs, number each disc before inserting it into the optical drive of the computer. To create a backup using Backup and Restore Center, follow these steps:



Be sure that the computer is connected to AC power before you start the backup process.

The backup process may take over an hour, depending on file size and the speed of the computer.

1. Select **Start > All Programs > Maintenance > Backup and Restore Center**.

2. Follow the on-screen instructions to back up your entire computer (select models only) or your files.



Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

## Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- **Windows recovery tools:** You can use the Backup and Restore Center to recover information you have previously backed up. You can also use Windows Startup Repair to fix problems that might prevent Windows from starting correctly.
- **f11 recovery tools:** You can use the **f11** recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.



If you are unable to boot (start up) your computer, you must purchase a Windows Vista operating system DVD to reboot the computer and repair the operating system. For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this chapter.

## Using the Windows recovery tools

To recover information you previously backed up, follow these steps:

1. Click **Start > All Programs > Maintenance > Backup and Restore Center.**
2. Follow the on-screen instructions to recover your entire computer (select models only) or your files.



Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

To recover your information using Startup Repair, follow these steps:



**CAUTION:** Using Startup Repair completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process restores the operating system, as well as the drivers, software, and utilities from the backup used for recovery.

1. If possible, back up all personal files.
2. If possible, check for the presence of the Windows partition and the HP Recovery partition. To find the partitions, select **Start > Computer.**



If the Windows partition and the HP Recovery partition have been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the Driver Recovery disc (both purchased separately). For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this chapter.

3. Restart the computer, and then press **f8** before the Windows operating system loads.
4. Select **Repair your computer.**
5. Follow the on-screen instructions.



For additional information on recovering information using the Windows tools, perform a search for these topics in Help and Support.

## Using f11



**CAUTION:** Using **f11** completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The **f11** recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled.

To recover the original hard drive image using **f11**, follow these steps:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition. To find the partition, select **Start > Computer**.



If the HP Recovery partition has been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the Driver Recovery disc (both purchased separately). For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this chapter.

3. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
4. Press **f11** while the “Press <F11> for recovery” message is displayed on the screen.
5. Follow the on-screen instructions.

## Using a Windows Vista operating system DVD (purchased separately)

If you are unable to boot (start up) your computer, you must purchase a Windows Vista operating system DVD to reboot the computer and repair the operating system. Make sure that your most recent backup (stored on discs or on an external drive) is easily accessible. To order a Windows Vista operating system DVD, go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions. You can also order the DVD by calling technical support. For contact information, refer to the Worldwide Telephone Numbers booklet included with the computer.



**CAUTION:** Using a Windows Vista operating system DVD completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers, software, and utilities.

To initiate recovery using a Windows Vista operating system DVD, follow these steps:



This process takes several minutes.

1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows Vista operating system DVD into the optical drive before the Windows operating system loads.
3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.
5. Click **Next**.
6. Select **Repair your computer**.
7. Follow the on-screen instructions.

# Backup and recovery in Windows XP

## Overview

To protect your information, use the Windows Backup utility (select models only) to back up files and folders or create recovery points. In case of system failure, you can use the backup files to restore your computer.

Windows provides the following options:

- Backing up individual files and folders
- Backing up all files and folders
- Scheduling automatic backups
- Creating recovery points
- Recovering information



For detailed instructions, perform a search for these topics in Help and Support.

In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

## Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

You can back up individual files or folders to an optional external hard drive or to a network drive.

Note the following when backing up:

- Store personal files in the My Documents folder, and back it up periodically.
- Back up templates stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time saver if you have to reset your preferences.

To copy the screen and paste it into a word-processing document:

a. Display the screen you want to save.

b. Copy the screen image:

To copy only the active window, press **alt+fn+prt sc**.

To copy the entire screen, **press fn+prt sc**.

c. Open a word-processing document, click **Edit > Paste**.

The screen image is added to the document.

d. Save the document.

To create a backup using the Windows Backup utility (select models only), follow these steps:



Be sure that the computer is connected to AC power before you start the backup process.

The backup process may take over an hour, depending on file size and the speed of the computer.

1. Click **Start > All Programs > Accessories > System Tools > Backup**.
2. Follow the on-screen instructions.

## Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools (select models only): You can use the Windows Backup utility to recover information you have previously backed up.
- Operating System and Driver Recovery discs (included with your computer): You can use the discs to recover your operating system and programs installed at the factory.

## Recovering your information

To recover information you previously backed up, follow these steps:

1. If possible, back up all personal files.
2. Click **Start > All Programs > Accessories > System Tools > Backup**.  
The Backup or Restore Wizard opens.
3. Click **Restore files and settings**, and then click **Next**.
4. Follow the on-screen instructions.



For additional information on initiating a recovery in Windows, perform a search for this topic in Help and Support.

---

## Recovering the operating system and programs



**CAUTION:** The recovery process reformats and completely erases the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery process reinstalls the original operating system, software, and drivers. Software, drivers, and updates not installed by HP must be manually reinstalled.

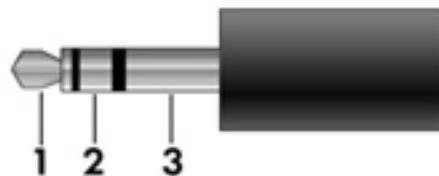
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To recover your operating system and programs, follow these steps:

1. If possible, back up all personal files.
2. Insert the *Operating System* disc into the optical drive.
3. Shut down the computer.
4. Turn on the computer.
5. Follow the on-screen instructions to install the operating system.
6. After the operating system is installed, remove the *Operating System* disc and insert the *Driver Recovery* disc.
7. Follow the on-screen instructions to install the drivers and programs.

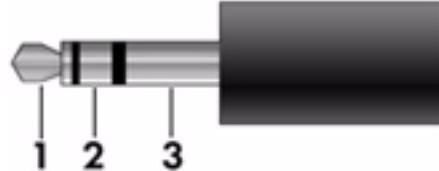
## Connector pin assignments

### Audio-in (microphone)



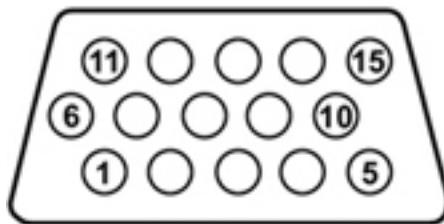
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

### Audio-out (headphone)



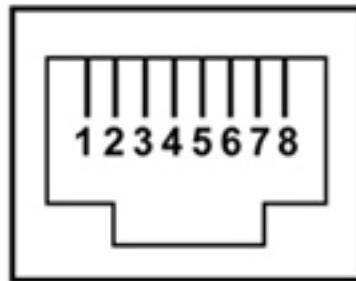
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

## External monitor



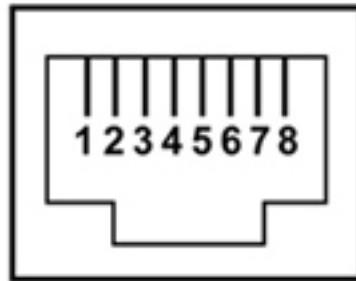
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

## RJ-11 (modem)



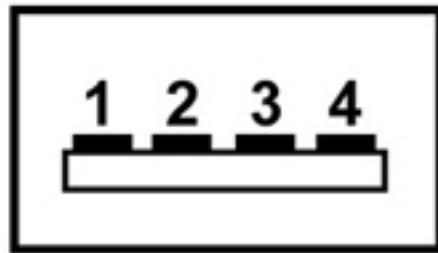
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused
7	Unused
8	Unused

## RJ-45 (network)



Pin	Signal
1	Transmit +
2	Transmit -
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

## Universal Serial Bus



Pin	Signal
1	+5 VDC
2	Data
3	Data +
4	Ground

## Power cord set requirements

The wide range input feature of the computer permits it to operate from any line voltage from 100 to 120 volts AC or from 220 to 240 volts AC.

The 3-conductor power cord set included with the computer meets the requirements for use in the country or region where the equipment is purchased.

Power cord sets for use in other countries and regions must meet the requirements of the country or region where the computer is used.

### Requirements for all countries and regions

The requirements listed below are applicable to all countries and regions:

- The length of the power cord set must be at least 1.5 m (5.0 ft) and no more than 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

## Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	CCC	5
South Korea	EK	4
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm<sup>2</sup> conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

## Recycling

### Battery

When a battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for computer battery disposal.

### Display



**WARNING:** The backlight contains mercury. Caution must be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.



**CAUTION:** The procedures in this chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.



**Materials Disposal.** This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, or see the Electronic Industries Alliance (EIA) Web site at <http://www.eiae.org>.

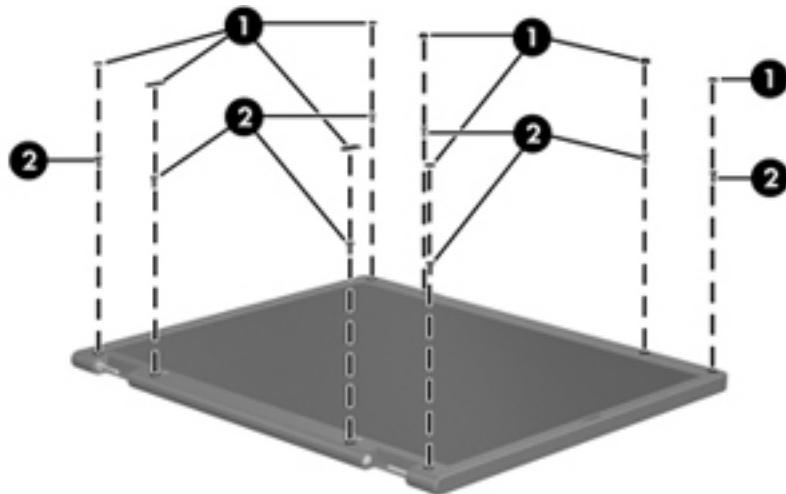
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight ① and the liquid crystal display (LCD) panel ②.



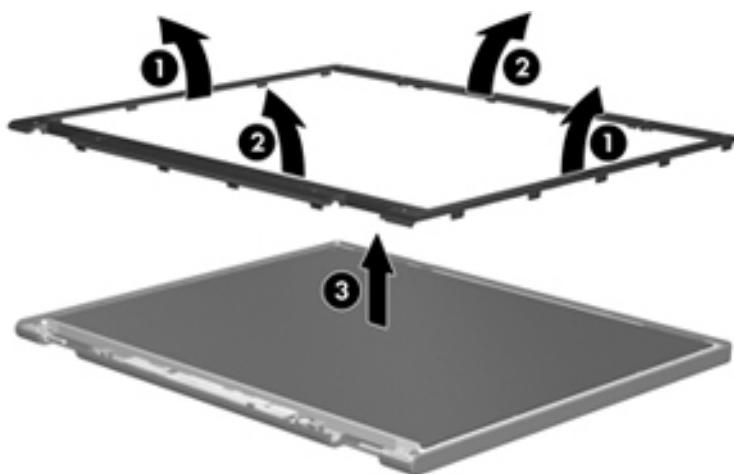
The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

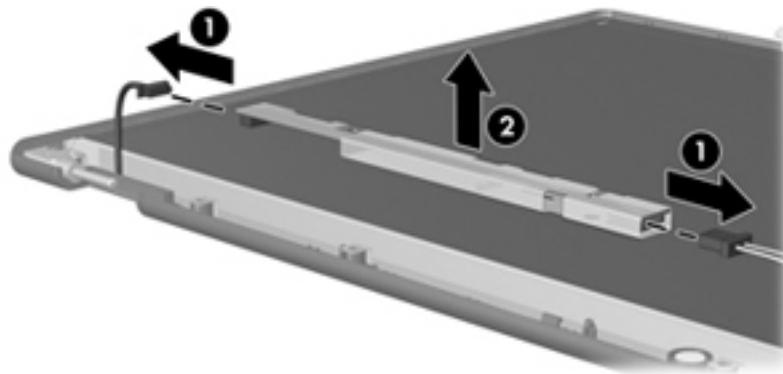
1. Remove all screw covers ① and screws ② that secure the display bezel to the display assembly.



2. Lift up and out on the left and right inside edges ① and the top and bottom inside edges ② of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel ③.

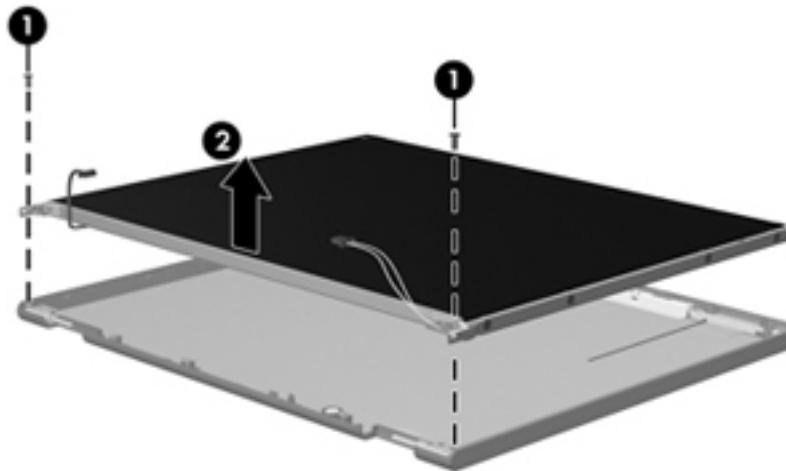


4. Disconnect all display panel cables **1** from the display inverter and remove the inverter **2**.



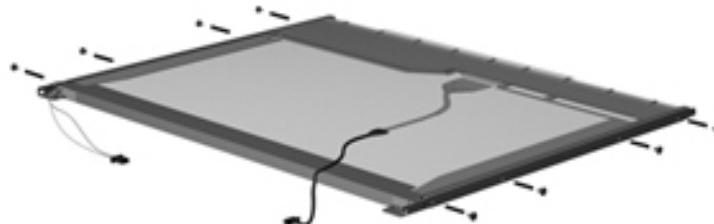
5. Remove all screws **1** that secure the display panel assembly to the display enclosure.

6. Remove the display panel assembly **2** from the display enclosure.

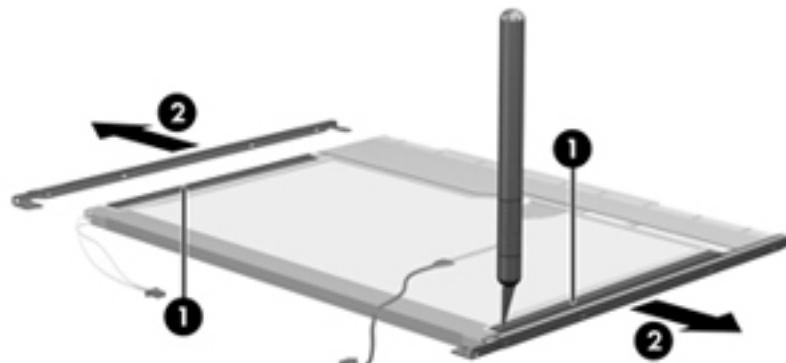


7. Turn the display panel assembly upside down.

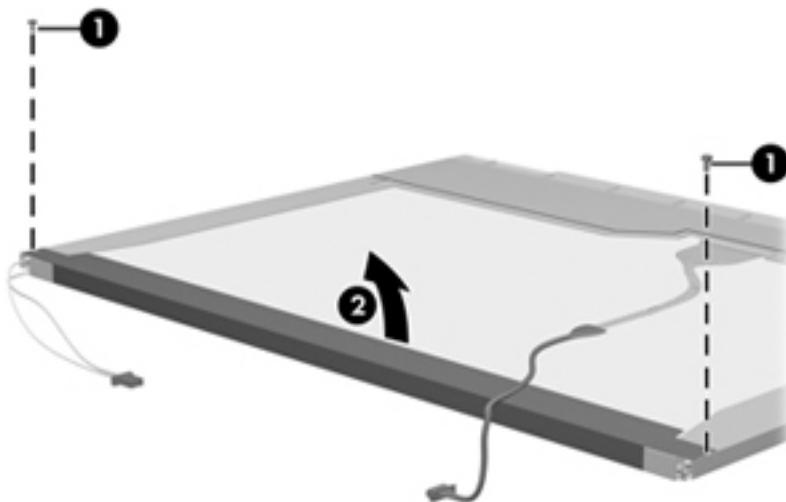
8. Remove all screws that secure the display panel frame to the display panel.



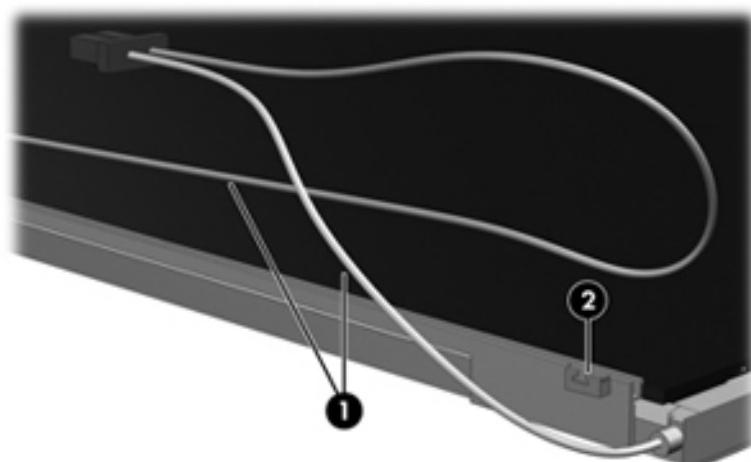
9. Use a sharp-edged tool to cut the tape **1** that secures the sides of the display panel to the display panel frame.
10. Remove the display panel frame **2** from the display panel.



11. Remove the screws **1** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **2** and swing it outward.

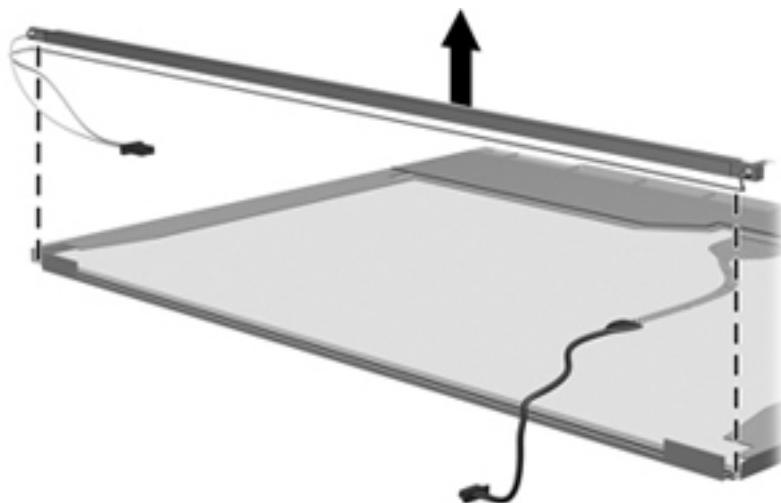


13. Remove the backlight cover.
14. Turn the display panel right-side up.
15. Remove the backlight cables **1** from the clip **2** in the display panel.

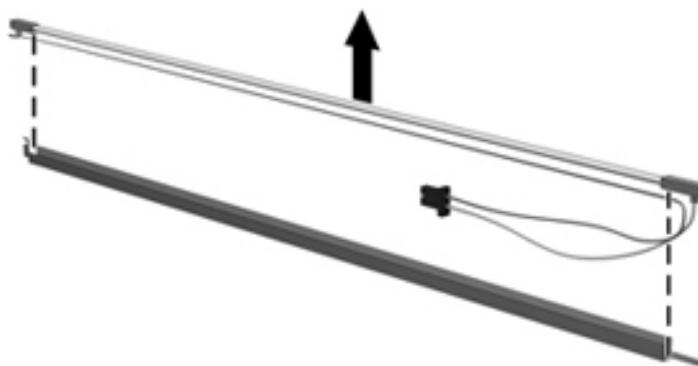


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

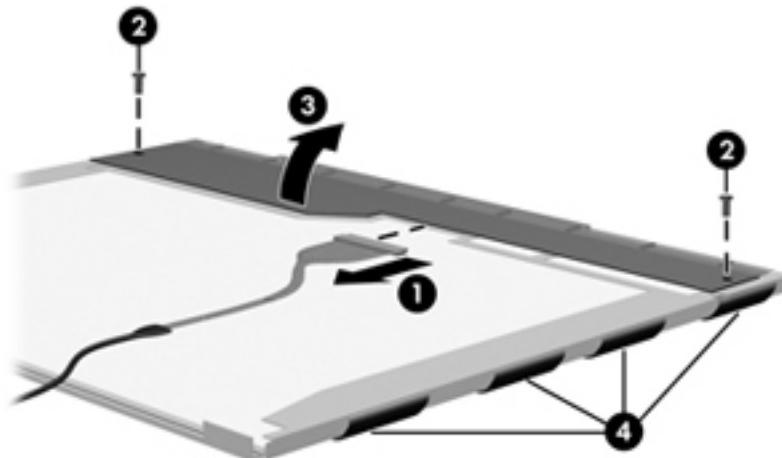
**WARNING:** The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.



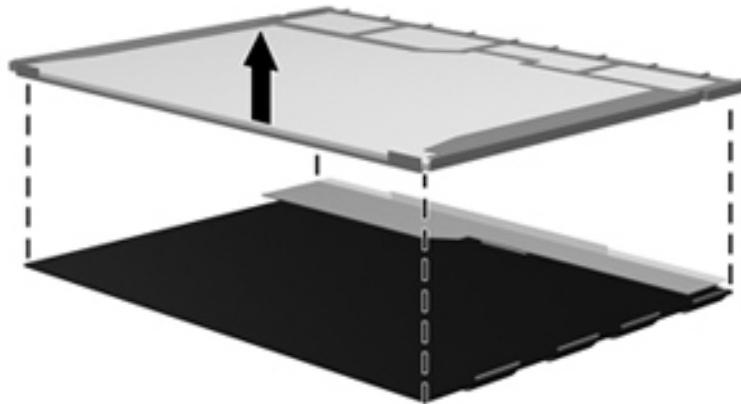
18. Remove the backlight from the backlight frame.



19. Disconnect the display cable **1** from the LCD panel.
20. Remove the screws **2** that secure the LCD panel to the display rear panel.
21. Release the LCD panel **3** from the display rear panel.
22. Release the tape **4** that secures the LCD panel to the display rear panel.



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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